TABLE 2-1a. UNIVERSE OF HAZARDOUS WASTE BURNING ON-SITE INCINERATORS

Site ID	Sys	Company	City	State	EPA ID
229	OINC	Vulcan Materials Co.	Wichita	KS	KSD007482029
334	OINC	3M	Cottage Grove	MN	MND006172969
337	OINC	Olin Chemicals	East Alton	IL	ILD006271696
338	OINC	Dupont	Orange	TX	TXD008081101
340	OINC	Miles, Inc.	New Martinsville	WV	WVD056866312
341	OINC	GLAXO Inc.	Research Triangle Park	NC	NCD065655599
342	OINC	Upjohn Co.	Kalamazoo	MI	MID000820381
348	OINC	Occidental Chemical Corp.	Niagara Falls	NY	NYD000824482
350	OINC	Dupont - Beaumont Works	Beaumont	TX	TXD008079212
353	OINC	Dow Chemical Co.	Midland	MI	MID000724724
354	OINC	Dow Chemical Co.	Midland	MI	MID000724724
358	OINC	Eli Lilly And Company	Lafayette	IN	IND006050967
453	OINC	Cargill Chemical Products Division	Forest Park	GA	GAD084823301
454	OINC	FMC Agricultural Chemical Group	Baltimore	MD	MDD003071875
455	OINC	Dupont	Parkersburg	WV	WVD045875291
456	OINC	Curwood, Inc.	New London	WI	WID006144737
457	OINC	University Of Wisconsin At Madison	Arlington	WI	WID000713594
458	OINC	Trane Thermal Company	Conshohocken	PA	PAD069006419
459	OINC	Trane Thermal Company	Conshohocken	PA	PAD069006419
460	OINC	Akzo Chemie America	Morris	IL	ILD065237851
461	OINC	Cook Composites (Freeman Chemical Co.)	Chatham	VA	VAD055046049
463	OINC	Miles (Mobay Chemical Corporation)	Kansas City	MO	MOD056389828
464	OINC	B.P. Chemicals (Standard Oil)	Lima	OH	OHD042157644
465	OINC	Allied Fibers	Hopewell	VA	VAD065385296
468	OINC	Lonza Chemicals-Riverisidc (Smithkline)	Conshohocken	PA	PAD980550412
477	OINC	American Cyanamid	Hannibal	MO	MOD050226075
478	OINC	American Cyanamid	Hannibal	MO	MOD050226075
480	OINC	CIBA-Geigy Corporation	St. Gabriel	LA	LAD053783445
483	OINC	Hoechst Celanese	Seabrook	TX	TXD000719286
484	OINC	Arkansas Eastman	Batesville	AR	ARD089234884
490	OINC	CIBA-Geigy Corporation	Mcintosh	AL	ALD001221902
495	OINC	PPG Industries, Inc.	Circleville	OH	OHD004304689
504	OINC	Chevron Chemical Co.	Philadelphia	PA	PAD049791098
505	OINC	BASF Corporation	Freeport	TX	TXD008081697
506	OINC	BASF Corporation	Freeport	TX	TXD008081697
600	OINC	Dow Chemical Co.	Freeport	TX	TXD008092793
604	OINC	BASF Corporation	Geismer	LA	LAD040776809
605	OINC	Shell Oil Company	Deer Park	CA	TXD067285973
606	OINC	Georgia Gulf Corporation	Plaquemine	LA	LAD057117434
607	OINC	Merck, Sharp And Dohme	West Point	PA	PAD002387926
610	OINC	Shell Oil Co	Norco	LA	LAD980622104
611	OINC	Shell Oil Co	Norco	LA	LAD980622104
613	OINC	Texas Eastman	Longview	TX	TXD007330202
614	OINC	Occidental Chemical Corp.	Gregory	TX	TXD982286932
700	OINC	Dupont	Wilmington	DE	DED003930807
701	OINC	Eli Lilly And Company	Clinton	IN	IND072040348
702	OINC	Dupont - Beaumont Works	Beaumont	TX	TXD008079212
704	OINC	Ashland Chemical Company	Los Angeles	CA	CAD044046274
705	OINC	CIBA-Geigy Corporation	Mcintosh	AL	ALD001221902

TABLE 2-1a. UNIVERSE OF HAZARDOUS WASTE BURNING ON-SITE INCINERATORS

Site ID	Sys	Company	City	State	EPA ID
706	OINC	CIBA-Geigy Corporation	St. Gabriel	LA	LAD053783445
707	OINC	Dupont - Beaumont Works	Beaumont	TX	TXD008079212
708	OINC	Burroughs Wellcome	Greenville	NC	NCD047373766
711	OINC	Chevron Chemical Co.	Bell Chasse	LA	LAD034199802
712	OINC	Nepera	Harriman	NY	NYD002014595
714	OINC	Olin Chemicals	Lake Charles	LA	LAD008080681
725	OINC	ZENECA	Bayonne	NJ	NJD001707944
726	OINC	Shell Oil Co.	Martinez	CA	CAD009164021
728	OINC	Eli Lilly And Company	Mayaquez	PR	PRD091024786
784	OINC	Cook Composites	Port Washington	WI	WID980615439
805	OINC	American Cyanamid	Hannibal	MO	MOD050226075
806	OINC	Amoco Oil Co.	Whiting	IN	IND000810861
808	OINC	Dow Chemical Co.	Plaquemine	LA	LAD008187080
809	OINC	Tennessee Eastman Co.	Kingsport	TN	TND003376928
810	OINC	Tennessee Eastman Co.	Kingsport	TN	TND003376928
824	OINC	Pennwalt Corporation	Thorofare	NJ	NJD980753875
825	OINC	General Electric Co.	Waterford	NY	NYD002080034
904	OINC	First Chemical Corporation	Pascagoula	MS	MSD033417031
905	OINC	Velsicol Chemical Corporation	Memphis	TN	TND007024664
906	OINC	Monsanto Agricultural Company	Muscatine	IA	IAD005273594
915	OINC	Eastman Kodak	Rochester	NY	NYD980592497
A10	OINC	Air Products And Chemicals Inc	Paulsboro	NJ	NJD002373579
A12	OINC	Aztec Peroxides Inc	Elyria	OH	OHD046202602
A21	OINC	Cytec Industries	Willow Island	WV	WVD004341491
A22	OINC	Dow Chemical Company/La Porte Site	La Porte	TX	TXD000017756
A27	OINC	EIF Atochem North America, Inc.	Calvert City	KY	KYD006370159
A28	OINC	EIF Atochem North America, Inc.	Houston	TX	TXD008090011
A31	OINC	Hercules Inc-Franklin Plant	Franklin	VA	VAD003122165
A33	OINC	Hoechst Celanese Corp.	Clear Lake	TX	TXD078432457
A36	OINC	Lubrizol Corporation	Painesville	OH	OHD004172623
A37	OINC	Mcwhorter Inc (Cargill)	Carpentersville	IL	ILD005083316
A38	OINC	Merck & Co Inc - Cherokee Plant	Riverside	PA	PAD003043353
A39	OINC	Merck Sharp & Dohme Quimica	Barceloneta	PR	PRD090028101
A41	OINC	NALCO Chemical Company	Sugar Land	TX	TXD008084618
A43	OINC	Occidental Chemical Corp	Niagara Falls	NY	NYD002103216
A45	OINC	Occidental Chemical Vcm	Deer Park	TX	TXD981911209
A46	OINC	OSI Specialties, Inc.	Sisterville	WV	WVD004325353
A47	OINC	Phillips Research Center	Bartlesville	OK	OKD000803601
A50	OINC	Quantum Chemical Company	La Porte	TX	TXD058276130
A53	OINC	Rmi Titanium Co. Sodium Plant	Ashtabula	OH	OHD000810242
A54	OINC	Sandoz Agro, Inc.	Beaumont	TX	TXD067261412
A55	OINC	Schenectady International, Inc.	Rotterdam Jct.	NY	NYD002070118
A56	OINC	Searle	Augusta	GA	GAD039046800
A57	OINC	Searle & Co.	Caguas	PR	PRD090378225
A59	OINC	Squibb Manufacturing, Inc.	Humacao	PR	PRD090021056
A60	OINC	Sterling Chemicals, Inc.	Texas City	TX	TXD008079527
A61	OINC	Teledyne Wah Chang Albany	Albany	OR	ORD050955848
A62	OINC	Texaco Chemical Company	Conroe	TX	TXD008076853
A64	OINC	Thiokol Corp	Elkton	MD	MDD003067121

TABLE 2-1a. UNIVERSE OF HAZARDOUS WASTE BURNING ON-SITE INCINERATORS

Site ID	Sys	Company	City	State	EPA ID
A66	OINC	Union Carbide Corporation, Texas City Pl	Texas City	TX	TXD000461533
B10	OINC	Aerojet	Sacramento	CA	CAD981457302
B14	OINC	B.P. Chemicals	Port Lavaca	TX	TXD000751172
B15	OINC	Ecova Corp.	Kimball	NE	NED981723513
B17	OINC	FMC Corporation	Pasadena	TX	TXD083570051
B20	OINC	GSX Chemical Services	Cleveland	OH	OHD980569438
B21	OINC	Hercules Aerospace	Magna	UT	UTD001705029
B23	OINC	Huntsman Corp.	Port Neches	TX	TXD008076846
B30	OINC	Lubrizol Corp.	Wickliffe	OH	OHD004172565
B32	OINC	Miles Corp.	Baytown	TX	TXD058260977
B33	OINC	Nissan	Smyrna	TN	TND054481205
B34	OINC	Organic Incineration Technologies	Fairbanks	AK	AK0000094888
B35	OINC	Parkens International	Houston	TX	TXD008105959
B36	OINC	Phillips	Sweeney	TX	TXD048210645
B39	OINC	Quantum Chemical	Morris	IL	ILD048296180
B46	OINC	Texas Instruments	Sherman	TX	TXD982759706
B56	OINC	U.T. Southwestern Medical Ctr.	Dallas	TX	TXD071378822
B57	OINC	Uniroyal	Geismar	LA	LAD008194060
B58	OINC	Vulcan Chemicals	Geismar	LA	LAD092681824
C12	OINC	Atochem	Beaumont	TX	TXD074180019
C16	OINC	Dupont	La Porte	TX	TXD008079642

TABLE 2-1b. UNIVERSE OF HAZARDOUS WASTE BURNING GOVERNMENT INCINERATORS

Site ID	Sys	Company	City	State	EPA ID
344	GOV	Department Of The Army	Johnston Atoll	TT	TT0570090011
346	GOV	Department Of The Army	Johnston Atoll	TT	TT0570090011
347	GOV	Department Of The Army South	Tooele	UT	UT5210090002
349	GOV	Radford Army Ammunition Plant	Radford	VA	VA1210020730
351	GOV	Iowa Army Ammunition Plant	Middletown	IA	IA7213820445
357	GOV	Department Of Energy	Oak Ridge	TN	TN0890090004
470	GOV	Department Of The Army	Johnston Atoll	TT	TT0570090011
471	GOV	Department Of The Army	Johnston Atoll	TT	TT0570090011
493	GOV	Department Of The Army North	Tooele	UT	UT3213820894
494	GOV	Department Of The Army North	Tooele	UT	UT3213820894
503	GOV	Lake City Army Ammunition Plant	Independence	MO	MO4213820489
602	GOV	Westinghouse Savannah River Company	Aiken	SC	SC1890008989
727	GOV	Iowa Army Ammunition Plant	Middletown	IA	IA7213820445
A42	GOV	Nat'L Inst Of Envr Health Sci	R.T.P.	NC	NC2750890004
B12	GOV	Anniston Army Depot	Anniston	AL	AL3210020027
B24	GOV	Idaho National Engineering Laboratory	Idaho Falls	ID	ID4890008952
B25	GOV	Iowa State University	Ames	IA	IAD981121486
B26	GOV	Kansas Army Ammunition Plant	Parsons	KS	KS0213820467
B37	GOV	Pine Bluff Arsenal	Pine Bluff	AR	AR0213820707
B45	GOV	Sierra Army Depot	Herlong	CA	CA5210020843
B49	GOV	U.S. Aberdeen Proving Grounds	Aberdeen	MD	MD3210021355
B51	GOV	U.S. Army Hawthorne	Hawthorne	NV	NV1210090006
C13	GOV	U.S. Army Savanna Army Depot	Savanna	IL	ILD3210020803
C14	GOV	Sterling	Barceloneta	PR	PRD991291949
C15	GOV	U.S. Air Force Minot Air Force Base	Minot	ND	ND4571924758

TABLE 2-1c. UNIVERSE OF HAZARDOUS WASTE BURNING COMMERCIAL INCINERATORS

Site ID	Sys	Company	City	State	EPA ID
209	CINC	Laidlaw Environmental Services	Roebuck	SC	SCD981467616
210	CINC	LWD, Inc.	Calvert City	KY	KYD088438817
211	CINC	LWD, Inc.	Calvert City	KY	KYD088438817
212	CINC	LWD, Inc.	Calvert City	KY	KYD088438817
214	CINC	Rollins Environmental Services	Baton Rouge	LA	LAD010395127
216	CINC	Rollins Environmental Services	Bridgeport	NJ	NJD053288239
222	CINC	Waste Technologies Industries	East Liverpool	OH	OHD980613541
324	CINC	Allied Corporation	Birmingham	AL	ALD031499833
325	CINC	Aptus	Coffeyville	KS	KSD981506025
327	CINC	Aptus	Aragonite	UT	UTD981552177
331	CINC	Ross Incineration Services	Grafton	OH	OHD048415665
333	CINC	Trade Waste Incineration	Sauget	IL	ILD098642424
359	CINC	Atochem	Carrollton	KY	KYD006373922
486	CINC	ENSCO	El Dorado	AR	ARD069748192
487	CINC	ENSCO	El Dorado	AR	ARD069748192
601	CINC	Laidlaw Environmental Services, Inc.	Clive	UT	UTD982595795
603	CINC	Chemical Waste Management	Port Arthur	TX	TXD000838896
609	CINC	Rollins Environmental Services	Deer Park	TX	TXD055141378
612	CINC	Trade Waste Incineration	Sauget	IL	ILD098642424
A15	CINC	BDT Inc (Laidlaw)	Clarence	NY	NYD000632372
A34	CINC	I C I Explosives USA Incorporated	Joplin	MO	MOD9857988164
B60	CINC	Waste Research And Reclamation	Eau Claire	WI	WID990829475
C10	CINC	American Envirotech	Channelview	TX	TXD982562787
C11	CINC	Reynolds Aluminum	Gum Springs	AR	ARD006354161

TABLE 2-1d. UNIVERSE OF HAZARDOUS WASTE BURNING CEMENT KILNS

Site ID	Sys	Company	City	State	EPA ID
200	CK	Giant Cement Company	Harleyville	SC	SCD003351699
201	CK	Giant Cement Company	Harleyville	SC	SCD003351699
202	CK	Heartland Cement Company	Independence	KS	KSD980739999
203	CK	Holnam Inc.	Artesia	MS	MSD077655876
204	CK	Holnam Inc.	Clarksville	MO	MOD029729688
205	CK	Holnam Inc.	Holly Hill	SC	SCD003368891
206	CK	Holnam Inc.	Holly Hill	SC	SCD003368891
207	CK	Keystone Cement Company	Bath	PA	PAD002389559
208	CK	Keystone Cement Company	Bath	PA	PAD002389559
228	CK	Ash Grove Cement Company	Foreman	AR	ARD981512270
300	CK	ESSROC Corporation	Logansport	IN	IND005081542
302	CK	Lafarge	Paulding	OH	OHD987048733
303	CK	Lone Star Industries, Inc.	Cape Girardeau	MO	MO981127319
304	CK	Lone Star Industries, Inc.	Greencastle	IN	IND006419212
305	CK	Medusa Cement Company	Wampum	PA	PAD083965897
318	CK	Texas Industries, Inc.	Midlothian	TX	TXD0007349327
319	CK	Continental Cement Company	Hannibal	MO	MOD054018288
320	CK	Lafarge	Alpena	MI	MID005379607
321	CK	Medusa Cement Company	Demopolis	AL	ALD983192402
322	CK	Lafarge	Fredonia	KS	KSD007148034
323	CK	Lafarge	Fredonia	KS	KSD007148034
335	CK	Medusa Cement Company	Wampum	PA	PAD083965897
401	CK	Ash Grove Cement Company	Chanute	KS	KSD031203318
402	CK	Ash Grove Cement Company	Chanute	KS	KSD031203318
403	CK	Ash Grove Cement Company	Foreman	AR	ARD981512270
404	CK	Ash Grove Cement Company	Foreman	AR	ARD981512270
473	CK	Texas Industries, Inc.	Midlothian	TX	TXD0007349327
491	CK	ESSROC Corporation	Logansport	IN	IND005081542
680	CK	Giant Cement Company	Harleyville	SC	SCD003351699
681	CK	Giant Cement Company	Harleyville	SC	SCD003351699

TABLE 2-1e. UNIVERSE OF HAZARDOUS BURNING LIGHTWEIGHT AGGREGATE KILNS

Site ID	Sys	Company	City	State	EPA ID
225	LWAK	Solite	Norwood	NC	NCD003152642
307	LWAK	Thermalkem (Norlite)	Cohoes	NY	NYD080469935
310	LWAK	Solite	Brooks	KY	KYD059568220
311	LWAK	Solite	Cascade	VA	VAD046970521
312	LWAK	Solite	Cascade	VA	VAD046970521
313	LWAK	Solite	Arvonia	VA	VAD042755082
314	LWAK	Solite	Arvonia	VA	VAD042755082
336	LWAK	Solite	Cascade	VA	VAD046970521
475	LWAK	Solite	Brooks	KY	KYD059568220
479	LWAK	Thermalkem (Norlite)	Cohoes	NY	NYD080469935

TABLE 3-1. BASELINE COST MODEL SPREADSHEET FOR COMMERCIAL INCINERATORS

Parameters		Input	Values
A. Facility Characteristics			
A1	System Type	= site specific input	Rotary Kiln
A2	Number of Units at This Facility	= site specific input	3
A3	Number of Units Tested	= site specific input	2
A4	Stack Gas Flow (acfm)	= site specific input	17,735
A5	Stack Gas Flow (dscfm)	= site specific input	5,838
A6	Stack Oxygen Fraction	= site specific input	0.10
A7	Waste Feed Capacity (lb/hr)	= site specific input	19,116
A8	Existing APCDs	= site specific input	SD/FF
A9	Capital Cost	= site specific input	$357,522.
A10	Annualized Capital Cost ($/yr)	= site specific input	$36,017.
A11	Fixed Annual O&M Costs ($/yr)	= site specific input	$198,346.
A12	Variable Annual O&M Costs ($/ton/yr)	= site specific input	$19.
A13	Waste Heat Boiler (Yes or No)	= site specific input	No
	Auxiliary Fuel Type		
A14	Natural Gas	= site specific input	0
A15	Fuel Oil	= site specific input	FUEL OIL
A16	Coal	= site specific input	0
A17	None	= site specific input	0
A18	Liquid Feed % of Total	= site specific input	0.17
A19	Sludge Feed % of Total	= site specific input	0.07
A20	Solid Feed % of Total	= site specific input	0.76
A21	Liquid Waste Heating Value (Btu/lb)	= site specific input	3,770
A22	Sludge Waste Heating Value (Btu/lb)	= site specific input	10,467
A23	Solid Waste Heating Value (Btu/lb)	= site specific input	6,544
A24	Total Waste Heating Value (Btu/lb)	=A18*A21+A19*A22+A20*A23	6,362
A25	Annual Liquid Waste Feedrate	=A28*A18	3,832
A26	Annual Sludge Waste Feedrate	=A28*A19	1,635
A27	Annual Solid Waste Feedrate	=A28*A20	17,659
A28	Total Annual Waste Feedrate	= site specific input	23,126
A29	Total Hourly Feedrate	=A28*2000/8000	5,781
A30	Waste Ash %	= site specific input	0.00
	Auxiliary Fuel Ash %		
A31	Fuel Oil	= site specific input	0.01
A32	Coal	= site specific input	0.00

TABLE 3-1. BASELINE COST MODEL SPREADSHEET FOR COMMERCIAL INCINERATORS

Parameters		Input	Values
A33	Ash Feedrate	=IF(A30="",0,(A28*A30))+IF(A31<>"",((A36*8000*A31*10^6)/(2000*18265)),0)+IF(A32<>"",((A37*8000*A32*10^6)/(2000*13000)),0)	4
A34	Waste Thermal Input (mmBtu/hr)	=A24*A29/10^6	36.78
	Auxiliary Fuel Thermal Input (mmBtu/hr)		
A35	Natural Gas	= site specific input	0.00
A36	Fuel Oil	= site specific input	3.66
A37	Coal	= site specific input	0.00
A38	None	=0	0
A39	Estimated Thermal Input (mmBtu/hr)	=(A5/10000)*60*((21-(A6*100))/21)	18.29
B. Capital Expenditures			
B1	Incinerator System	=IF(OR(A1="Rotary Kiln",A1="Fluidized Bed"),(((EXP(-0.66149808))*(A39^0.5542949))*10^6, IF(OR(A1="Liquid Injection",A1="Two Chamber"),((EXP(2.104595))*(A39^0.5057352))*10^6,IF(A1="Rotary Hearth",(((((EXP(0.6614908))*(A39^0.5542949))*10^6)+((EXP(2.104595))*(A39^0.5057352))*10^6)/2,FALSE)))	$2,584,612.
B2	Waste Heat Boiler	=IF(A13="Yes",(40000*(A39/10)^0.6),0)*(1052/813.6)	$0.
B3	Waste Storage	=764328*((A7/40000)^0.6)	$490,777.
B4	Auxiliary Buildings & Warehouses	=146594*(A7^0.2076)	$1,134,841.
B5	Waste Water	=(3200000*(A5/66300)^0.6)	$744,745.
B6	Total Equipment and Installation (TE&I)	=SUM(B1,A9)+SUM(B2:B5)	$5,312,497.
B7	Engineering (10% of TE&I)	=0.1*B6	$531,250.
B8	Start-Up (2% of TE&I)	=0.02*B6	$106,250.
B9	Subtotal Capital Equipment	=SUM(B6:B8)	$5,949,996.
B10	Contingency (20%)	=0.2*B9	$1,189,999.
B11	Total Capital Equipment	=SUM(B9:B10)	$7,139,996.
Other Capital Investments			
	Permit Acquisition		
B12	RCRA or BIF Permit Acquisition	=IF(A3>1,((IF(A5<13000,300000,(121988*LN(A5))-850000))+((IF(A5<13000,300000,(121988*(LN(A5))-850000))/2)*(A3-1)))/A3),IF(A5<13000,300000,(121988*(LN(A5))-850000)))	$225,000.
B13	Updating RCRA Permit	=B12*0.25	$56,250.

TABLE 3-1. BASELINE COST MODEL SPREADSHEET FOR COMMERCIAL INCINERATORS

Parameters		Input	Values
B14	Compliance Testing/Trial Burn	=IF(A3>1,((290000+((0.75*290000)*(A3-1)))/A3),290000)	$253,750.
B15	Legal and Financing	=IF(A3>1,(((B6*0.12)+((B6*0.06)*(A3-1)))/A3),(B6*0.12))	$478,125.
B16	Total Other Capital Investments	=SUM(B12:B15)	$1,013,125.
B17	Total Capital Expenditures	=B16+B11	$8,153,120.
C. Annual Costs			
Annual Direct Costs			
	Labor Requirements		
	Labor (Burdened at 23%)		
C1	Waste Feeding	=IF(A1="Liquid Injection",0,(16*2080*6*1.23))	$245,606.
C2	Combustor and CEM Operations	=16*2080*6*1.23	$245,606.
C3	Maintenance	=0.35*SUM(C1:C2)	$171,924.
C4	Supervisor	=(0.15*SUM(C1:C2))/A2	$24,561.
C5	Waste Handling and Storage	=IF(AND(A1="Liquid Injection",A4<=50000),10*2080*3*1.23/A2,IF(AND(A1="Liquid Injection",A4>50000),10*2080*6*1.23/A2,IF(AND(A1<>"Liquid Injection",A4<=50000),10*2080*6*1.23/A2,IF(AND(A1<>"Liquid Injection",A4>50000),10*2080*9*1.23/A2,ERROR))))	$51,168.
C6	Manager and Technical/Regulatory Support	=50000*1*1.23/A2	$20,500.
C7	Administrative	=60000*1*1.23/A2	$24,600.
C8	Clerical	=IF(A4<=50000,(25000*1*1.23/A2),(25000*2*1.23/A2))	$10,250.
C9	Safety Coordinator	=45760*1*1.23/A2	$18,762.
	Operating Costs		
C10	Administrative Labor	=SUM(C6:C9,C4)	$98,672.
C11	Operations Labor	=SUM(C1:C3,C5)	$714,305.
C12	Utilities	=IF(OR(A1="Liquid Injection",A1="Two Chamber"),(3.1911*(A5)),IF(OR(A1="Rotary Kiln",A1="Fluidized Bed"),(6.295*(A5)^0.8977),IF(A1="Rotary Hearth",(((3.1911*(A5))+(6.295*(A5)^0.8977))/2),FALSE)))	$15,135.
C13	Liquid Waste Sampling and Analysis	=(533*((A25*2000)/0.72)/(8.33*20000))	$34,052.
C14	Solid Waste Sampling and Analysis	=(533*((A27*2000)/40000))	$470,603.
C15	Ash Leachability Sampling	=(271*A33/100)	$11.
	Auxiliary Fuel		
C16	Natural Gas	=IF(A14="Natural Gas",(A35*3.27*8000),0)	$0.
C17	Fuel Oil (Residual)	=IF(A15="Fuel Oil",(A36*4.62*8000),0)	$135,274.
C18	Coal	=IF(A16="Coal",(A37*1.33*8000),0)	$0.
C19	Solid Waste Disposal	=A33*200	$802.

TABLE 3-1. BASELINE COST MODEL SPREADSHEET FOR COMMERCIAL INCINERATORS

Parameters		Input	Values
C20	Heat Recovery Credit	=IF(A13="Yes",(-0.6*A39*1.33*8000),0)	$0.
	Replacement Parts for Operation and Maintenance		
C21	Incineration System	=B1*0.05	$129,231.
C22	System Monitors	=20000	$20,000.
C23	Fixed Annual O&M Costs of APCDs	=A11/10	$19,835.
C24	Variable Annual O&M Costs of APCDs	=A12*A28	$433,207.
C25	Waste Heat Boiler	=0.08*B2	$0.
C26	Automatic Shutdown	=5735*(A7/40000)^0.6	$3,682.
C27	Waste Storage and Feed	=0.02*B3	$9,816.
C28	Total Annual Direct Costs	=SUM(C10:C15)+SUM(C16:C20)+SUM(C21:C27)	$2,084,624.
Annual Indirect Costs			
C29	Administrative Charges (2% Capital)	=0.02*B11	$142,800.
C30	Property Taxes (1% Capital)	=0.01*B11	$71,400.
C31	Insurance (1% Capital)	=0.01*B11	$71,400.
C32	Environmental Damage Liability Insurance	=150000	$150,000.
C33	Medical Surveillance	=500*(IF(AND(A1="Liquid Injection",A4<=50000),13,IF(AND(A1="Liquid Injection",A4>50000),17,IF(AND(A1<>"Liquid Injection",A4<=50000),22, IF(AND(A1<>"Liquid Injection",A4>50000),26,ERROR)))))	$11,000.
C34	Security	=300000	$300,000.
C35	Total Annual Indirect Costs	=SUM(C29:C34)	$746,600.
D. Capital Recovery			
D1	Permitting Capital Recovery @ 20 Years	=((0.07*(1+0.07)^20)/((1+0.07)^20-1)*B12)	$21,238.
D2	System Equipment Capital Recovery @ 15 Years	=((0.07*(1+0.07)^15)/((1+0.07)^15-1)*((B11-A9)+B15))	$797,175.
D3	Permitting Updating Capital Recovery @ 5 Years	=((0.07*(1+0.07)^5)/((1+0.07)^5-1))*(B13+B14)	$75,606.
D4	Total Annualized Capital Costs	=SUM(D1:D3)	$894,019.
E. Output			
E1	Hazardous Waste (ton/yr)	=A28	23,126
	Costs		
E2	Capital Costs ($)	=B17	$8,153,120.
E3	Annualized Capital Costs ($/yr)	=D4	$894,019.
E4	Fixed Annual O&M Costs ($/yr)	=C35+C10+C23	$865,107.
E5	Variable Annual O&M Costs ($/yr)	=SUM(C16:C20)+SUM(C21:C27)+SUM(C11:C15)-C23	$1,966,117.
	Costs ($/ton)		
E6	Annualized Capital Costs ($/ton)	=E3/E1	$39.

TABLE 3-1. BASELINE COST MODEL SPREADSHEET FOR COMMERCIAL INCINERATORS

Parameters		Input	Values
E7	Fixed Annual O&M Costs ($/ton)	=E4/E1	$37.
E8	Variable Annual O&M Costs ($/ton)	=E5/E1	$85.
	Employees		
E9	Number of Full-Time Employees per System	=SUM(C1:C3)/35000	20.4
E10	Number of Full-Time Employees per Facility	=SUM(C4:C9)/40000	2.5

TABLE 3-2. BASELINE COST MODEL SPREADSHEET FOR ON-SITE INCINERATORS

	Parameters	Input	Values
A. Facility Characteristics			
A1	System Type	= site specific input	Rotary Kiln
A2	Number of Units at This Facility	= site specific input	2
A3	Number of Units Tested	= site specific input	1
A4	Stack Gas Flow (acfm)	= site specific input	103,727
A5	Stack Gas Flow (dcsfm)	= site specific input	55,032
A6	Stack Oxygen Fraction	= site specific input	0.15
A7	Waste Feed Capacity (lb/hr)	= site specific input	35,612
A8	Existing APCDs	= site specific input	QC/VS/C
A9	Capital Costs	= site specific input	$887,797.
A10	Annualized Capital Costs ($/yr)	= site specific input	$111,924.
A11	Fixed Annual O&M Costs ($/yr)	= site specific input	$179,021.
A12	Variable Annual O&M Costs ($/ton/yr)	= site specific input	$9.
A13	Waste Heat Boiler (Yes or No)	= site specific input	No
	Auxiliary Fuel Type		
A14	Natural Gas	= site specific input	0
A15	Fuel Oil	= site specific input	FUEL OIL
A16	Coal	= site specific input	0
A17	None	= site specific input	0
A18	Liquid Feed % of Total	= site specific input	0.18
A19	Sludge Feed % of Total	= site specific input	0.00
A20	Solid Feed % of Total	= site specific input	0.82
A21	Liquid Waste Heating Value (Btu/lb)	= site specific input	8,763
A22	Sludge Waste Heating Value (Btu/lb)	= site specific input	6,269
A23	Solid Waste Heating Value (Btu/lb)	= site specific input	6,544
A24	Total Waste Heating Value	=A18*A21+A19*A22+A20*A23	6,941
A25	Annual Liquid Waste Feedrate	=A28*A18	15,731
A26	Annual Sludge Waste Feedrate	=A28*A19	0
A27	Annual Solid Waste Feedrate	=A28*A20	72,153
A28	Total Annual Waste Feedrate	= site specific input	87,884
A29	Total Hourly Waste Feedrate	=A28*2000/8000	21,971
A30	Waste Ash (%)	= site specific input	0.00
	Auxiliary Fuel Ash (%)		
A31	Fuel Oil	= site specific input	0.01
A32	Coal	= site specific input	0.00

TABLE 3-2. BASELINE COST MODEL SPREADSHEET FOR ON-SITE INCINERATORS

Parameters		Input	Values
A33	Ash Feedrate	=IF(A30="",0,(A28*A30))+IF(A31<>"",((A36*8000*A31*10^6)/(2000*18265)),0)+IF(A32<>"",((A37*8000*A32*10^6)/(2000*13000)),0)	21
A34	Waste Thermal Input (mmBtu/hr)	=A24*A29/10^6	152.51
	Auxiliary Fuel Thermal Input (mmBtu/hr)		
A35	Natural Gas	= site specific input	0.00
A36	Fuel Oil	= site specific input	19.60
A37	Coal	= site specific input	0.00
A38	None	= 0	0
A39	Estimated Thermal Input	=(A5/10000)*60*((21-(A6*100))/21)	98.01
B. Capital Expenditures			
B1	Incinerator System	=IF(OR(A1="Rotary Kiln",A1="Fluidized Bed"),(((EXP(-0.6614908))*(A39^0.5542949))*10^6),IF(OR(A1="Liquid Injection",A1="Two Chamber"),((EXP(2.104595))*(A39^0.5057352))*10^6,IF(A1="Rotary Hearth",(((((EXP(-0.6614908))*(A39^0.5542949))*10^6)+((EXP(-2.104595))*(A39^0.5057352))*10^6)/2,FALSE)))	$6,553,415.
B2	Waste Heat Boiler	=IF(A13="Yes",(40000*(A39/10)^0.6),0)*(1052/813.6)	$0.
B3	Waste Storage	=764328*((A7/40000)^0.6)	$712,858.
B4	Waste Water Treatment	=(2000000*(A5/86900)^0.6)	$1,520,503.
B5	Total Equipment and Installation (TE&I)	=SUM(B1,A9)+SUM(B2:B4)	$9,674,573.
B6	Engineering (10% of TE&I)	=0.1*B5	$967,457.
B7	Start-Up (2% of TE&I)	=0.02*B5	$193,491.
B8	Subtotal Capital Equipment	=SUM(B5:B7)	$10,835,522.
B9	Contingency (20%)	=0.2*B8	$2,167,104.
B10	Total Capital Equipment	=SUM(B8:B9)	$13,002,626.
Other Capital Investments			
	Permit Acquisition		
B11	RCRA or BIF Permit Acquisition	=IF(A3>1,((IF(A5<13000,300000,(121988*(LN(A5))-850000))+((IF(A5<13000,300000,(121988*(LN(A5))-850000))/2)*(A3-1)))/A3),IF(A5<13000,300000,(121988*(LN(A5))-850000)))	$481,581.
B12	Updating RCRA Permit	=B11*0.25	$120,395.
B13	Compliance Testing/Trial Burn	=IF(A3>1,((290000+((0.75*290000)*(A3-1)))/A3),290000)	$290,000.
B14	Legal & Financing (12% Capital Equipment)	=IF(A3>1,(((B5*0.12)+((B5*0.06)*(A3-1)))/A3),(B5*0.12))	$1,160,949.

TABLE 3-2. BASELINE COST MODEL SPREADSHEET FOR ON-SITE INCINERATORS

Parameters		Input	Values
B15	Total Other Capital Investments	=SUM(B11:B14)	$2,052,925.
B16	Total Capital Expenditures	=B15+B10	$15,055,551.
C. Annual Costs			
Annual Direct Costs			
Labor Requirements			
Labor (Burdened at 23%)			
C1	Waste Handling, Storage and Feeding	=0	$0.
C2	Combustor and CEM Operations	=IF(AND(A1="Liquid Injection",A4<=20000),20*2080*1*1.23,IF(AND(A1="Liquid Injection",A4>20000,A4<45000),20*2080*1.5*1.23,IF(AND(A1="Liquid Injection",A4>=45000,20*2080*2*1.23, IF(AND(A1<>"Liquid Injection,A4<=20000),20*2080*3*1.23,IF(AND(A1<>"Liquid Injection",A4>20000,A4<45000),20*2080*6*1.23,IF(AND(A1<>"Liquid Injection",A4>=45000),20*2080*6*1.23,"Error"))))))	$307,008.
C3	Maintenance	=0.35*SUM(C1:C2)	$107,453.
C4	Supervisor	=0.15*SUM(C1:C2)	$23,026.
C5	Manager and Technical/Regulatory Support	=IF(AND(A1="Liquid Injection",A4<=20000),0.5*55000*1.23/A2,IF(AND(A1="Liquid Injection",A4>20000,A4<45000),1*55000*1.23/A2,IF(AND(A1="Liquid Injection",A4>=45000,1.5*55000*1.23/A2, IF(AND(A1<>"Liquid Injection,A4<=20000),0.5*55000*1.23/A2,IF(AND(A1<>"Liquid Injection",A4>20000,A4<45000),1*55000*1.23/A2,IF(AND(A1<>"Liquid Injection",A4>=45000),1.5*55000*1.23/A2,"Error"))))))	$50,738.
	Operating Costs		
C6	Administrative Labor	=SUM(C4:C5)	$73,763.
C7	Operations Labor	=SUM(C1:C3)	$414,461.
C8	Utilities	=IF(OR(A1="Liquid Injection",A1="Two Chamber"),(3.1911*(A5)),IF(OR(A1="Rotary Kiln",A1="Fluidized Bed"),(6.295*(A5)^0.8977),IF(A1="Rotary Hearth",(((3.1911*(A5))+(6.295*(A5)^0.8977))/2),FALSE)))	$113,409.
C9	Waste Sampling and Analysis	=(IF(A21>0,1,0)+IF(A22>0,1,0)+IF(A23>0,1,0)*3*12*533)	$19,190.
	Auxiliary Fuel		
C10	Natural Gas	=IF(A14="Natural Gas",(A35*3.27*8000),0)	$0.

TABLE 3-2. BASELINE COST MODEL SPREADSHEET FOR ON-SITE INCINERATORS

Parameters		Input	Values
C11	Fuel Oil (Residual)	=IF(A15="Fuel Oil",(A36*4.62*8000),0)	$724,416.
C12	Coal	=IF(A16="Coal",(A37*1.33*8000),0)	$0.
C13	Solid Waste Disposal	=A33*200	$4,292.
C14	Heat Recovery Credit	=IF(A13="Yes",(-0.6*A39*1.33*8000),0)	$0.
	Replacement Parts for Operation & Maintenance		
C15	Incineration System	=B1*0.05	$327,671.
C16	System Monitors	=$20000	$20,000.
C17	Fixed Annual O&M Costs of APCDs	=A11/10	$17,902.
C18	Variable Annual O&M Costs of APCDs	=A12*A28	$785,880.
C19	Waste Heat Boiler	=0.08*B2	$0.
C20	Waste Storage and Feed	=0.02*B3	$14,257.
C21	Total Annual Direct Costs	=SUM(C6:C9)+SUM(C10:C14)+SUM(C15:C20)	$2,515,241.
Annual Indirect Costs			
C22	Administrative Charges (2% Capital)	=0.02*B10	$260,053.
C23	Property Taxes (1% Capital)	=0.01*B10	$130,026.
C24	Insurance	=0.01*B10	$130,026.
C25	Recordkeeping	=$25000	$25,000.
C26	Medical Surveillance	=500*(IF(AND(A1="Liquid Injection",A4<=20000),1.5,IF(AND(A1="Liquid Injection",A4>20000,A4<45000),2.5,IF(AND(A1="Liquid Injection",A4>=45000,3.5, IF(AND(A1<>"Liquid Injection,A4<=20000),3.5,IF(AND(A1<>"Liquid Injection",A4>20000,A4<45000),7,IF(AND(A1<>"Liquid Injection",A4>=45000),7.5,"Error"))))))	$3,500.
C27	Total Annual Indirect Costs	=SUM(C22:C26)	$548,605.
D. Capital Recovery			
D1	Permitting Capital Recovery @ 20 Years	=((0.07*(1+0.07)^20)/((1+0.07)^20-1)*B11)	$45,458.
D2	System Equipment Capital Recovery @ 15 Years	=((0.07*(1+0.07)^15)/((1+0.07)^15-1))*((B10-A8)+B14)	$1,457,609.
D3	Permitting Updating Capital Recovery @ 5 Years	=((0.07*(1+0.07)^5)/((1+0.07)^5-1))*(B12+B13)	$100,092.
D4	Total Annualized Capital Costs	=SUM(D1:D3)	$1,603,158.
E. Output			
E1	Hazardous Waste (ton/yr)	=A28	87,884
	Costs		
E2	Capital Costs ($)	=B16	$15,055,551.

TABLE 3-2. BASELINE COST MODEL SPREADSHEET FOR ON-SITE INCINERATORS

Parameters		Input	Values
E3	Annualized Capital Costs ($/yr)	=D4	$1,603,158.
E4	Fixed Annual O&M Costs ($/yr)	=C27+C6+C17	$640,270.
E5	Variable Annual O&M Costs	=SUM(C10:C14)+SUM(C15:C20)+SUM(C7:C9)-C17	$2,423,575.
	Costs ($/ton)		
E6	Annualized Capital Costs	=E3/E1	$18.
E7	Fixed Annual O&M Costs	=E4/E1	$7.
E8	Variable Annual O&M Costs	=E5/E1	$28.
	Employees		
E9	Number of Full-TimeEmployees per System	=(SUM(C1:C3)/35000)	11.8
E10	Number of Full-Time Employees per Facility	=(SUM(C4:C5)/40000)	1.8

TABLE 3-3. BASELINE COST MODEL SPREADSHEET FOR GOVERNMENT INCINERATORS

Parameters		Input	Values
A. Facility Characteristics			
A1	System Type	= site specific input	Rotary Kiln
A2	Number of Units at This Facility	= site specific input	2
A3	Number of Units Tested	= site specific input	2
A4	Stack Gas Flow (acfm)	= site specific input	3,143
A5	Stack Gas Flow (dcsfm)	= site specific input	2,686
A6	Stack Oxygen Fraction	= site specific input	0.18
A7	Waste Feed Capacity (lb/hr)	= site specific input	178
A8	Existing APCDs	= site specific input	GC/C/FF
A9	Capital Costs	= site specific input	$273,918.
A10	Annualized Capital Costs ($/yr)	= site specific input	$28,976.
A11	Fixed Annual O&M Costs ($/yr)	= site specific input	$151,778.
A12	Variable Annual O&M Costs ($/ton/yr)	= site specific input	$11.
A13	Waste Heat Boiler (Yes or No)	= site specific input	No
	Auxiliary Fuel Type		
A14	Natural Gas	= site specific input	NATURAL GAS
A15	Fuel Oil	= site specific input	0
A16	Coal	= site specific input	0
A17	None	= site specific input	0
A18	Liquid Feed % of Total	= site specific input	0.00
A19	Sludge Feed % of Total	= site specific input	0.00
A20	Solid Feed % of Total	= site specific input	1.00
A21	Liquid Waste Heating Value (Btu/lb)	= site specific input	8,763
A22	Sludge Waste Heating Value (Btu/lb)	= site specific input	6,269
A23	Solid Waste Heating Value (Btu/lb)	= site specific input	6,544
A24	Total Waste Heating Value	=A18*A21+A19*A22+A20*A23	6,544
A25	Annual Liquid Waste Feedrate	=A28*A18	0
A26	Annual Sludge Waste Feedrate	=A28*A19	0
A27	Annual Solid Waste Feedrate	=A28*A20	368
A28	Total Annual Waste Feedrate	= site specific input	368
A29	Total Hourly Waste Feedrate	=A28*2000/8000	92
A30	Waste Ash (%)	= site specific input	0.00
	Auxiliary Fuel Ash (%)		

TABLE 3-3. BASELINE COST MODEL SPREADSHEET FOR GOVERNMENT INCINERATORS

Parameters		Input	Values
A31	Fuel Oil	= site specific input	0.00
A32	Coal	= site specific input	0.00
A33	Ash Feedrate	=IF(A30="",0,(A28*A30))+IF(A31<>"",((A36*8000*A31*10^6)/(2000*18265)),0)+IF(A32<>"",((A37*8000*A32*10^6)/(2000*13000)),0)	0
A34	Waste Thermal Input (mmBtu/hr)	=A24*A29/10^6	0.60
	Auxiliary Fuel Thermal Input (mmBtu/hr)		
A35	Natural Gas	= site specific input	0.47
A36	Fuel Oil	= site specific input	0.00
A37	Coal	= site specific input	0.00
A38	None	= 0	0
A39	Estimated Thermal Input	=(A5/10000)*60*((21-(A6*100))/21)	2.35
B. Capital Expenditures			
B1	Incinerator System	=IF(OR(A1="Rotary Kiln",A1="Fluidized Bed"),(((EXP(-0.6614908))*(A39^0.5542949))*10^6),IF(OR(A1="Liquid Injection",A1="Two Chamber"),((EXP(2.104595))*(A39^0.5057352))*10^6,IF(A1="Rotary Hearth",(((((EXP(-0.6614908))*(A39^0.5542949))*10^6)+((EXP(-2.104595))*(A39^0.5057352))*10^6)/2,FALSE)))	$829,396.
B2	Waste Heat Boiler	=IF(A13="Yes",(40000*(A39/10)^0.6),0)*(1052/813.6)	$0.
B3	Waste Storage	=764328*((A7/40000)^0.6)	$29,669.
B4	Waste Water Treatment	=(2000000*(A5/86900)^0.6)	$248,366.
B5	Total Equipment and Installation (TE&I)	=SUM(B1,A9)+SUM(B2:B4)	$1,381,349.
B6	Engineering (10% of TE&I)	=0.1*B5	$138,135.
B7	Start-Up (2% of TE&I)	=0.02*B5	$27,627.
B8	Subtotal Capital Equipment	=SUM(B5:B7)	$1,547,111.
B9	Contingency (20%)	=0.2*B8	$309,422.
B10	Total Capital Equipment	=SUM(B8:B9)	$1,856,533.
Other Capital Investments			
	Permit Acquisition		

TABLE 3-3. BASELINE COST MODEL SPREADSHEET FOR GOVERNMENT INCINERATORS

Parameters		Input	Values
B11	RCRA or BIF Permit Acquisition	=IF(A3>1,((IF(A5<13000,300000,(121988*(LN(A5))-850000))+((IF(A5<13000,300000,(121988*(LN(A5))-850000))/2)*(A3-1))/A3),IF(A5<13000,300000,(121988*(LN(A5))-850000)))	$225,000.
B12	Updating RCRA Permit	=B11*0.25	$56,250.
B13	Compliance Testing/Trial Burn	=IF(A3>1,((290000+((0.75*290000)*(A3-1)))/A3),290000)	$253,750.
B14	Legal and Financing (12% Capital Equipment)	=IF(A3>1,(((B5*0.12)+((B5*0.06)*(A3-1)))/A3),(B5*0.12))	$124,321.
B15	Total Other Capital Investments	=SUM(B11:B14)	$659,321.
B16	Total Capital Expenditures	=B15+B10	$2,515,855.
C. Annual Costs			
Annual Direct Costs			
	Labor Requirements		
	Labor (Burdened at 23%)		
C1	Waste Handling, Storage and Feeding	=0	$0.
C2	Combustor & CEM Operations	=IF(AND(A1="Liquid Injection",A4<=20000),20*2080*1*1.23,IF(AND(A1="Liquid Injection",A4>20000,A4<45000),20*2080*1.5*1.23,IF(AND(A1="Liquid Injection",A4>=45000,20*2080*2*1.23, IF(AND(A1<>"Liquid Injection,A4<=20000),20*2080*3*1.23,IF(AND(A1<>"Liquid Injection",A4>20000,A4<45000),20*2080*6*1.23,IF(AND(A1<>"Liquid Injection",A4>=45000),20*2080*6*1.23,"Error"))))))	$153,504.
C3	Maintenance	=0.35*SUM(C1:C2)	$53,726.
C4	Supervisor	=0.15*SUM(C1:C2)	$11,513.
C5	Manager and Technical/Regulatory Support	=IF(AND(A1="Liquid Injection",A4<=20000),0.5*55000*1.23/A2,IF(AND(A1="Liquid Injection",A4>20000,A4<45000),1*55000*1.23/A2,IF(AND(A1="Liquid Injection",A4>=45000,1.5*55000*1.23/A2, IF(AND(A1<>"Liquid Injection,A4<=20000),0.5*55000*1.23/A2,IF(AND(A1<>"Liquid Injection",A4>20000,A4<45000),1*55000*1.23/A2,IF(AND(A1<>"Liquid Injection",A4>=45000),1.5*55000*1.23/A2,"Error"))))))	$16,913.
	Operating Costs		
C6	Administrative Labor	=SUM(C4:C5)	$28,425.

TABLE 3-3. BASELINE COST MODEL SPREADSHEET FOR GOVERNMENT INCINERATORS

Parameters		Input	Values
C7	Operations Labor	=SUM(C1:C3)	$207,230.
C8	Utilities	=IF(OR(A1="Liquid Injection",A1="Two Chamber"),(3.1911*(A5)),IF(OR(A1="Rotary Kiln",A1="Fluidized Bed"),(6.295*(A5)^0.8977),IF(A1="Rotary Hearth",(((3.1911*(A5))+(6.295*(A5)^0.8977))/2),FALSE)))	$7,539.
C9	Waste Sampling and Analysis	=(IF(A21>0,1,0)+IF(A22>0,1,0)+IF(A23>0,1,0)*3*12*533)	$19,190.
	Auxiliary Fuel		
C10	Natural Gas	=IF(A14="Natural Gas",(A35*3.27*8000),0)	$12,295.
C11	Fuel Oil (Residual)	=IF(A15="Fuel Oil",(A36*4.62*8000),0)	$0.
C12	Coal	=IF(A16="Coal",(A37*1.33*8000),0)	$0.
C13	Solid Waste Disposal	=A33*200	$0.
C14	Heat Recovery Credit	=IF(A13="Yes",(-0.6*A39*1.33*8000),0)	$0.
	Replacement Parts for Operation & Maintenance		
C15	Incineration System	=B1*0.05	$41,470.
C16	System Monitors	=$20000	$20,000.
C17	Fixed Annual O&M Costs of APCDs	=A11/10	$15,178.
C18	Variable Annual O&M Costs of APCDs	=A12*A28	$4,132.
C19	Waste Heat Boiler	=0.08*B2	$0.
C20	Waste Storage and Feed	=0.02*B3	$593.
C21	Total Annual Direct Costs	=SUM(C6:C9)+SUM(C10:C14)+SUM(C15:C20)	$356,053.
Annual Indirect Costs			
C22	Administrative Charges (2% Capital)	=0.02*B10	$37,131.
C23	Property Taxes (1% Capital)	=0.01*B10	$18,565.
C24	Insurance	=0.01*B10	$18,565.
C25	Recordkeeping	=$25000	$25,000.
C26	Medical Surveillance	=500*(IF(AND(A1="Liquid Injection",A4<=20000),1.5,IF(AND(A1="Liquid Injection",A4>20000,A4<45000),2.5,IF(AND(A1="Liquid Injection",A4>=45000,3.5, IF(AND(A1<>"Liquid Injection,A4<=20000),3.5,IF(AND(A1<>"Liquid Injection",A4>20000,A4<45000),7,IF(AND(A1<>"Liquid Injection",A4>=45000),7.5,"Error"))))))	$1,750.

TABLE 3-3. BASELINE COST MODEL SPREADSHEET FOR GOVERNMENT INCINERATORS

Parameters		Input	Values
C27	Total Annual Indirect Costs	=SUM(C22:C26)	$101,011.
D. Capital Recovery			
D1	Permitting Capital Recovery @ 20 Years	=((0.07*(1+0.07)^20)/((1+0.07)^20-1)*B11)	$21,238.
D2	System Equipment Capital Recovery @ 15 Years	=((0.07*(1+0.07)^15)/((1+0.07)^15-1))*((B10-A8)+B14)	$187,412.
D3	Permitting Updating Capital Recovery @ 5 Years	=((0.07*(1+0.07)^5)/((1+0.07)^5-1))*(B12+B13)	$75,606.
D4	Total Annualized Capital Costs	=SUM(D1:D3)	$284,257.
E. Output			
E1	Hazardous Waste (ton/yr)	=A28	368
	Costs		
E2	Capital Costs ($)	=B16	$2,515,855.
E3	Annualized Capital Costs ($/yr)	=D4	$284,257.
E4	Fixed Annual O&M Costs ($/yr)	=C27+C6+C17	$144,614.
E5	Variable Annual O&M Costs	=SUM(C10:C14)+SUM(C15:C20)+SUM(C7:C9)-C17	$312,449.
	Costs ($/ton)		
E6	Annualized Capital Costs	=E3/E1	$773.
E7	Fixed Annual O&M Costs	=E4/E1	$393.
E8	Variable Annual O&M Costs	=E5/E1	$850.
	Employees		
E9	Number of Full-TimeEmployees per System	=(SUM(C1:C3)/35000)	5.9
E10	Number of Full-Time Employees per Facility	=(SUM(C4:C5)/40000)	0.7

TABLE 3-4. BASELINE COST MODEL SPREADSHEET FOR CEMENT KILNS

Parameters		Input	Values
A. Facility Characteristics			
A1	System Type	=site specific input	Rotary Kiln
A2	Number of Units at This Facility	=site specific input	4
A3	Number of Units Tested	=site specific input	4
A4	Stack Gas Flow (acfm)	=site specific input	139,440
A5	Stack Gas Flow (dscfm)	=site specific input	62,042
A6	Stack Oxygen Fraction	=site specific input	0.13
A7	Waste Feed Capacity (lb/hr)	=site specific input	13,614
A8	Existing APCDs	=site specific input	FF
	Auxiliary Fuel Type		
A9	Natural Gas	=site specific input	0
A10	Fuel Oil	=site specific input	0
A11	Coal	=site specific input	COAL
A12	None	=site specific input	0
A13	Waste Heat Boiler (Yes or No)	=site specific input	No
A14	Liquid Feed % of Total	=site specific input	0.48
A15	Sludge Feed % of Total	=site specific input	0.35
A16	Solid Feed % of Total	=site specific input	0.17
A17	Liquid Waste Heating Value (Btu/lb)	=site specific input	13,047
A18	Sludge Waste Heating Value (Btu/lb)	=site specific input	12,867
A19	Solid Waste Heating Value (Btu/lb)	=site specific input	8,247
A20	Total Waste Heating Value (Btu/lb)	=A14*A17+A15*A18+A16*A19	12,153
A21	Annual Liquid Waste Feedrate	=A24*A14	24,227
A22	Annual Sludge Waste Feedrate	=A24*A15	17,740
A23	Annual Solid Waste Feedrate	=A24*A16	8,784
A24	Total Annual Waste Feedrate	=site specific input	50,751
A25	Hazardous Waste Burning Penalty ($/ton)	=site specific input	$17.
A26	Total Hourly Waste Feedrate	=A24*2000/8000	12,688
A27	Waste Thermal Input (mmBtu/hr)	=A20*A26/10^6	154.20
	Auxiliary Fuel Thermal Input (mmBtu/hr)		
A28	Natural Gas	=site specific input	0.00
A29	Fuel Oil	=site specific input	0.00
A30	Coal	=site specific input	12.00
A31	None	=0	0
A32	Total Auxiliary Fuel Thermal Input (mmBtu/hr)	=SUM(A28:A31)	12.00
A33	Actual Thermal Input (mmBtu/hr)	=A27+A32	166.20

TABLE 3-4. BASELINE COST MODEL SPREADSHEET FOR CEMENT KILNS

Parameters		Input	Values
B. Capital Expenditures			
B1	Liquid Waste Storage	=761328*(A21/38500)^0.6	$576,605.
B2	Solid Waste Storage	=133000*(A23/7650)^0.6	$144,501.
B3	Liquid Waste Feed System	=379292*(A21/38500)^0.6	$287,264.
B4	Solid Waste Feed System	=114503*(A23/7650)^0.6	$124,404.
B5	Waste Heat Boiler	=IF(A13="Yes",(40000*(A33/10)^0.6),0)*1.29	$0.
B6	Automatic Shutdown System	=71682*(A21/38500)^0	$71,682.
B7	Continuous Monitors	=153044*(A21/42500)^0	$153,044.
B8	Total Equipment and Installation (TE&I)	=SUM(B1:B7)	$1,357,500.
B9	Engineering (10% of Subtotal)	=(10/(100-(10+2)))*B8	$154,261.
B10	Start-Up (2% of Subtotal)	=(2/(100-(10+2)))*B8	$30,852.
B11	Subtotal Capital Equipment	=SUM(B8:B10)	$1,542,613.
B12	Contingency (20% of Subtotal)	=0.2*B11	$308,523.
B13	Total Capital Equipment	=SUM(B11:B12)	$1,851,136.
Other Capital Equipment			
	Permit Acquisition		
B14	RCRA or BIF Permit Acquisition	=IF(A3>1,((IF(A5<13000,300000,(121988*(LN(A5))-850000))+((IF(A5<13000,300000,(121988*(LN(A5))-850000))/2)*(A3-1))/A3),IF(A5<13000,300000,(121988*(LN(A5))-850000)))	$310,130.
B15	Updating RCRA Permit	=0.25*B14	$77,532.
B16	Compliance Testing/Trial Burn	=IF(A3>1,((340000+((0.75*340000)*(A3-1)))/A3),340000)	$276,250.
B17	Legal and Financing (12% Capital Equipment)	=IF(A3>1,(((B13*0.12)+((B13*0.06)*(A3-1)))/A3),(B13*0.12))	$138,835.
B18	Total Other Capital Investments	=SUM(B14:B17)	$802,747.
B19	Total Capital Expenditures	=B18+B13	$2,653,883.
C. Annual Costs			
Annual Direct Costs			
	Labor Requirements		
	Labor (Burdened at 23%)		
C1	Waste Receiving, Storage and Handling	=10*2080*9*1.23/A2	$69,077.
C2	Supervisor	=1*42000*1.23/A2	$12,915.
C3	Manager and Technical/Regulatory Support (Unburdened)	=1*50000*1.23/A2	$15,375.
C4	Administrator (Unburdened)	=0.5*68000*1.23/A2	$10,455.
C5	Clerical (Unburdened)	=0.5*25000*1.23/A2	$3,844.
C6	Safety Coordinator (Unburdened)	=0.5*45760*1.23/A2	$7,036.

TABLE 3-4. BASELINE COST MODEL SPREADSHEET FOR CEMENT KILNS

Parameters		Input	Values
	Operating Costs		
C7	Administrative Labor	=SUM(C2:C6)	$49,624.
C8	Operations Labor	=C1	$69,077.
C9	Utilities	=25728*(A21/38500)^0.6	$19,486.
C10	Liquid Waste Sampling and Analysis	=533*((A21*2000)/0.72)/(8.33*20000)	$215,306.
C11	Solid Waste Sampling and Analysis	=533*((A23*2000)/40000)	$234,093.
C12	Ash Leachability Sampling	=40650	$40,650.
C13	Heat Recovery Credit	=IF(A13="Yes",(-0.6*A32*1.33*8000),0)	$0.
	Maintenance (8% of Installed Equipment)		
C14	Waste Heat Boiler	=0.08*B5	$0.
C15	Waste Storage and Feed	=0.08*SUM(B1:B4)	$90,622.
C16	Penalty Associated with Burning Hazardous Waste	=A24*A25	$848,561.
C17	Automatic Shutdown	=0.08*B6	$5,735.
C18	System Monitors	=0.08*153044*(A7/42500)^0	$12,244.
C19	Total Annual Direct Costs	=SUM(C7:C18)	$1,585,397.
Annual Indirect Costs			
C20	Administrative Charges (2% Capital)	=0.02*B19	$53,078.
C21	Property Taxes (1% Capital)	=0.01*B19	$26,539.
C22	Insurance (1% Capital)	=0.01*B19	$26,539.
C23	Environmental Damage Liability Insurance	=150000	$150,000.
C24	Medical Surveillance	=500*12.5	$6,750.
C25	Security	=100000	$100,000.
C26	Total Annual Indirect Costs	=SUM(C20:C25)	$362,905.
D. Capital Recovery			
D1	Permitting Capital Recovery @ 20 Years	=((0.07*(1+0.07)^20)/((1+0.07)^20-1)*B14)	$29,274.
D2	System Equipment Capital Recovery @ 15 Years	=((0.07*(1+0.07)^15)/((1+0.07)^15-1))*(B19-(B14+B15+B16))	$218,488.
D3	Permitting Updating Capital Recovery @ 5 Years	=((0.07*(1+0.07)^5)/((1+0.07)^5-1))*(B15+B16)	$86,284.
D4	Total Annualized Capital Cost	=SUM(D2:D3)	$304,772.
E. Credits			
E1	Primary Fuel Credit ($/yr)	=A27*(-1.03)*8000	($1,270,599.)
F. Output Parameter			
F1	Hazardous Waste (ton/yr)	=A24	50,751
	Cost		
F2	Capital Costs ($)	=B19	$2,653,883.
F3	Annualized Capital Cost ($/yr)	=D4	$304,772.
F4	Fixed Annual O&M Costs ($/yr)	=C26+C7	$412,530.

TABLE 3-4. BASELINE COST MODEL SPREADSHEET FOR CEMENT KILNS

Parameters		Input	Values
F5	Variable Annual O&M Costs ($/yr)	=SUM(C8:C18)	$1,535,773.
	Credits		
F6	Primary Fuel Credit ($/yr)	=E1	($1,270,599.)
	Cost ($/ton)		
F7	Annualized Capital Cost	=F3/F1	$6.
F8	Fixed Annual O&M Costs	=F4/F1	$8.
F9	Variable Annual O&M Costs	=F5/F1	$30.
F10	HW Burning Penalty	=A25	$17.
	Credit ($/ton)		
F11	Primary Fuel Credit	=F6/F1	($25.)
	Employees		
F12	Number of Full-Time Employees per System		2.0
F13	Number of Full-Time Employees per Facility	=(SUM(C1:C6))/40000	1.2

TABLE 3-5. BASELINE COST MODEL SPREADSHEET FOR LIGHTWEIGHT AGGREGATE KILNS

Parameters			
A. Facility Characteristics			
A1	System Type	=site specific input	Rotary Kiln
A2	Number of Units at This Facility	=site specific input	2
A3	Number of Units Tested	=site specific input	2
A4	Stack Gas Flow (acfm)	=site specific input	59,638
A5	Stack Gas Flow (dscfm)	=site specific input	30,589
A6	Stack Oxygen Fraction	=site specific input	0.15
A7	Waste Feed Capacity (lb/hr)	=site specific input	6,971
A8	Existing APCDs	=site specific input	MC/HE/FF/VS/DM
	Auxiliary Fuel Type		
A9	Natural Gas	=site specific input	0
A10	Fuel Oil	=site specific input	FUEL OIL
A11	Coal	=site specific input	0
A12	None	=site specific input	0
A13	Waste Heat Boiler (Yes or No)	=site specific input	No
A14	Liquid Feed % of Total	=site specific input	0.94
A15	Sludge Feed % of Total	=site specific input	0.00
A16	Solid Feed % of Total	=site specific input	0.06
A17	Liquid Waste Heating Value (Btu/lb)	=site specific input	11,820
A18	Sludge Waste Heating Value (Btu/lb)	=site specific input	0
A19	Solid Waste Heating Value (Btu/lb)	=site specific input	0
A20	Total Waste Heating Value (Btu/lb)	=A14*A17+A15*A18+A16*A19	11,096
A21	Annual Liquid Waste Feedrate	=A24*A14	18,855
A22	Annual Sludge Waste Feedrate	=A24*A15	0
A23	Annual Solid Waste Feedrate	=A24*A16	1,230
A24	Total Annual Waste Feedrate	=site specific input	20,085
A25	Waste Ash %	=site specific input	0.00
A26	Total Hourly Waste Feedrate	=A24*2000/8000	5,021
A27	Waste Thermal Input (mmBtu/hr)	=A20*A26/10^6	56
	Auxiliary Fuel Thermal Input (mmBtu/hr)		
A28	Natural Gas	=site specific input	0.00
A29	Fuel Oil	=site specific input	110.63
A30	Coal	=site specific input	0.00
A31	None	=0	0
A32	Total Auxiliary Fuel Thermal Input (mmBtu/hr)	=SUM(A28:A31)	110.63
A33	Actual Heat Input (mmBtu/hr)	=A32+A27	166.34

TABLE 3-5. BASELINE COST MODEL SPREADSHEET FOR LIGHTWEIGHT AGGREGATE KILNS

Parameters			
B. Capital Expenditures			
B1	Liquid Waste Storage	=761328*((A21*1.3)/38500)^0.6	$580,645.
B2	Solid waste storage	=133000*((A23*1.3)/7650)^0.6	$52,000.
B3	Liquid Waste Feed System	=379292*((A7*A14)/10000)^0.6	$294,102.
B4	Solid Waste Feed System	=114503*((A23/2000)^0.6)	$85,542.
B5	Waste Heat Boiler	=IF(A13="Yes",(40000*(A33/10)^0.6),0)*1.29	$0.
B6	Automatic Shutdown System	=71682*(A7/10000)^0	$71,682.
B7	Continuous Monitors	=153044*(A7/42500)^0	$153,044.
B8	Total Equipment and Installation (TE&I)	=SUM(B1:B7)	$1,237,015.
B9	Engineering (10% of Subtotal)	=(10/(100-(10+2)))*B8	$140,570.
B10	Start-Up (2% of Subtotal)	=(2/(100-(10+2)))*B8	$28,114.
B11	Subtotal Capital Equipment	=SUM(B8:B10)	$1,405,699.
B12	Contingency (20% of Subtotal)	=0.2*B11	$281,140.
B13	Total Capital Equipment	=SUM(B11:B12)	$1,686,839.
Other Capital Investments			
	Permit acquisition		
B14	RCRA or BIF Permit Acquisition	=IF(A3>1,((IF(A5<13000,300000,(121988*(LN(A5))-850000))+((IF(A5<13000,300000,(121988*(LN(A5))-850000))/2)*(A3-1)))/A3),IF(A5<13000,300000,(121988*(LN(A5))-850000)))	$307,455.
B15	Updating RCRA Permit	=B14*0.25	$76,864.
B16	Compliance Testing/Trial Burn	=IF(A3>1,((300000+((0.75*300000)*(A3-1)))/A3),300000)	$262,500.
B17	Legal and Financing (12% Capital Equipment)	=IF(A3>1,(((B13*0.12)+((B13*0.06)*(A3-1)))/A3),(B13*0.12))	$151,816.
B18	Total Other Capital Investments	=SUM(B14:B17)	$798,635.
B19	Total Capital Expenditures	=B18+B13	$2,485,474.
C. Annual Costs			
Annual Direct Costs			
	Labor Requirements		
	Labor (Burdened at 23%)		
C1	Waste Receiving, Storage and Handling	=10*2080*9*1.23/A2	$115,128.
C2	Supervisor	=1*42000*1.23/A2	$25,830.
C3	Manager and Technical/Regulatory Support	=1*50000*1:23/A2	$30,750.
C4	Administrator	=0.5*60000*1.23/A2	$18,450.
C5	Clerical	=0.5*25000*1.23/A2	$7,688.
C6	Safety Coordinator	=0.5*45760*1.23/A2	$14,071.
Operating costs			

TABLE 3-5. BASELINE COST MODEL SPREADSHEET FOR LIGHTWEIGHT AGGREGATE KILNS

Parameters			
C7	Administrative Labor	=SUM(C2:C6)	$96,789.
C8	Operations Labor	=C1	$115,128.
C9	Liquid Waste Sampling and Analysis	=533*((A21*2000)/0.72)/(8.33*20000)	$167,558.
C10	Solid Waste Sampling and Analysis	=533*((A23*2000)/40000)	$32,784.
C11	Heat Recovery Credit	=IF(A13="Yes", (-0.6*A33*1.33*8000),0)	$0.
	Maintenance (8% of Installed Equipment)		
C12	Waste Heat Boiler	=0.08*B5	$0.
C13	Waste Storage and Feed	=0.08*SUM(B1:B4)	$80,983.
C14	Automatic Shutdown	=0.08*B6	$5,735.
C15	Continuous Monitors	=0.08*153044*(A21/42500)^0	$12,244.
C16	Total Annual Direct Costs	=SUM(C7:C15)	$511,221.
Annual Indirect Costs			
C17	Administrative Charges (2% Capital)	=0.02*B19	$49,709.
C18	Property Taxes (1% Capital)	=0.01*B19	$24,855.
C19	Insurance (1% Capital)	=0.01*B19	$24,855.
C20	Environmental Damage Liability Insurance	=150000	$150,000.
C21	Medical Surveillance	=500*12.5	$6,250.
C22	Security	=100000	$100,000.
C23	Recordkeeping	=25000	$25,000.
C24	Total Annual Indirect Costs	=SUM(C17:C23)	$380,669.
D. Capital Recovery			
D1	Permitting Capital Recovery @ 20 years	=((0.07*(1+0.07)^20)/((1+0.07)^20-1))*(B14)	$29,022.
D2	System Equipment Capital Recovery @ 15 years	=((0.07*(1+0.07)^15)/((1+0.07)^15-1))*(B19-(B14+B15+B16))	$201,874.
D3	Permitting Updating Capital Recovery @ 5 years	=((0.07*(1+0.07)^5)/((1+0.07)^5-1))*(B15+B16)	$82,768.
D4	Total Annualized Capital Cost	=SUM(D2:D3)	$284,642.
E. Credits			
E1	Primary Fuel Credit ($/yr)	=A27*(-1.33)*8000	($592,809.)
F. Output Parameter			
F1	Hazardous Waste (ton/yr)	=A24	20,085
	Cost		
F2	Capital Costs ($)	=B19	$2,485,474.
F3	Annualized Capital Cost ($/yr)	=D4	$284,642.
F4	Fixed Annual O&M Costs ($/yr)	=C24+C7	$477,458.
F5	Variable Annual O&M Costs ($/yr)	=SUM(C8:C15)	$414,432.
	Credits		
F6	Primary Fuel Credit ($/yr)	=E1	($592,809.)

TABLE 3-5. BASELINE COST MODEL SPREADSHEET FOR LIGHTWEIGHT AGGREGATE KILNS

Parameters			
	Costs ($/ton)		
F7	Annualized Capital Cost	=F3/F1	$14.
F8	Fixed Annual O&M Costs	=F4/F1	$24.
F9	Variable Annual O&M Costs	=F5/F1	$21.
	Credits ($/ton)		
F10	Primary Fuel Credit	=F6/F1	($30.)
	Employees		
F11	Number of Full-Time Employees per System	=C1/35000	3.3
F12	Number of Full-Time Employees per Facility	=(SUM(C2:C6))/40000	2.4

TABLE 3-6a. SUMMARY OF BASELINE COSTS FOR COMMERCIAL INCINERATORS

Site ID	Capital Cost ($)	Fixed O&M Annual Cost ($)	Variable O&M Annual Cost ($)	Annualized Capital Cost ($)	HW Feed (ton/yr)	Annualized Capital Cost ($/ton/yr)	Fixed O&M Annual Cost ($/ton/yr)	Variable O&M Annual Cost ($/ton/yr)	Empl per Comb Sys	Empl per Facility (EPA ID)
209	$ 7,653,457	$ 1,009,557	$ 6,901,840	$ 775,452	51,360	$ 15.10	$ 19.66	$ 134.38	11.7	6.5
210	$ 20,575,403	$ 1,370,043	$ 17,332,428	$ 1,993,523	120,375	$ 16.56	$ 11.38	$ 143.99	21.1	2.7
211	$ 13,188,030	$ 1,086,939	$ 6,528,203	$ 1,300,319	33,712	$ 38.57	$ 32.24	$ 193.65	21.1	2.7
212	$ 13,554,125	$ 1,101,381	$ 16,395,043	$ 1,332,346	58,504	$ 22.77	$ 18.83	$ 280.24	21.1	2.7
214	$ 17,147,572	$ 1,374,181	$ 13,847,978	$ 1,798,202	91,112	$ 19.74	$ 15.08	$ 151.99	23.3	7.4
216	$ 18,017,112	$ 1,414,240	$ 4,003,384	$ 1,923,760	22,972	$ 83.74	$ 61.56	$ 174.27	23.3	7.4
222	$ 26,520,734	$ 1,788,557	$ 15,817,769	$ 2,395,009	110,919	$ 21.59	$ 16.12	$ 142.61	25.5	8.2
324	$ 3,584,112	$ 864,210	$ 936,418	$ 437,841	2,488	$ 175.98	$ 347.35	$ 376.37	23.3	7.4
325	$ 15,573,212	$ 1,351,894	$ 14,715,356	$ 1,470,749	43,596	$ 33.74	$ 31.01	$ 337.54	23.3	7.4
327	$ 21,497,074	$ 1,604,338	$ 10,457,407	$ 2,026,535	164,504	$ 12.32	$ 9.75	$ 63.57	25.5	8.2
331	$ 19,082,011	$ 1,488,149	$ 14,837,262	$ 1,938,621	90,775	$ 21.36	$ 16.39	$ 163.45	25.5	8.2
333a	$ 11,685,313	$ 998,714	$ 3,940,538	$ 1,250,002	76,465	$ 16.35	$ 13.06	$ 51.53	20.4	2.5
333b	$ 11,685,313	$ 998,714	$ 3,940,538	$ 1,250,002	76,465	$ 16.35	$ 13.06	$ 51.53	20.4	2.5
359	$ 9,499,762	$ 1,107,039	$ 1,646,375	$ 1,016,258	9,856	$ 103.11	$ 112.32	$ 167.05	23.3	7.4
486	$ 13,509,253	$ 1,119,124	$ 2,170,425	$ 1,445,444	49,065	$ 29.46	$ 22.81	$ 44.24	21.1	3.7
487	$ 18,886,532	$ 1,324,644	$ 3,233,650	$ 2,031,583	98,130	$ 20.70	$ 13.50	$ 32.95	22.2	4.1
601	$ 25,357,641	$ 1,732,800	$ 49,248,794	$ 2,559,969	267,465	$ 9.57	$ 6.48	$ 184.13	25.5	8.2
603	$ 23,596,968	$ 1,654,561	$ 3,852,990	$ 2,399,934	114,815	$ 20.90	$ 14.41	$ 33.56	25.5	8.2
609	$ 29,696,870	$ 1,874,319	$ 7,151,971	$ 3,141,895	139,408	$ 22.54	$ 13.44	$ 51.30	25.5	8.2
612	$ 8,153,120	$ 865,107	$ 1,966,117	$ 894,019	23,126	$ 38.66	$ 37.41	$ 85.02	20.4	2.5

TABLE 3-6b. SUMMARY OF BASELINE COSTS FOR ON-SITE INCINERATORS

Site ID	Capital Cost ($)	Fixed O&M Annual Cost ($)	Variable O&M Annual Cost ($)	Annualized Capital Cost ($)	HW Feed (ton/yr)	Annualized Capital Cost ($/ton/yr)	Fixed O&M Annual Cost ($/ton/yr)	Variable O&M Annual Cost ($/ton/yr)	Empl per Comb Sys	Empl per Facility (EPA ID)
229	$ 1,661,696	$ 115,895	$ 1,692,679	$ 201,167	3,521	$ 57.13	$ 32.91	$ 480.71	2.0	1.0
334	$ 15,164,110	$ 729,854	$ 2,367,577	$ 1,475,913	89,863	$ 16.42	$ 8.12	$ 26.35	11.8	3.7
337a	$ 2,446,498	$ 139,214	$ 533,583	$ 296,870	7,359	$ 40.34	$ 18.92	$ 72.51	5.9	0.7
337b	$ 2,446,498	$ 139,214	$ 533,583	$ 296,870	7,359	$ 40.34	$ 18.92	$ 72.51	5.9	0.7
338	$ 17,254,292	$ 812,304	$ 5,485,575	$ 1,780,392	135,190	$ 13.17	$ 6.01	$ 40.58	11.8	3.7
340	$ 9,256,848	$ 481,888	$ 3,357,441	$ 908,142	26,375	$ 34.43	$ 18.27	$ 127.30	11.8	2.8
342	$ 5,073,682	$ 269,180	$ 584,795	$ 557,865	6,118	$ 91.18	$ 44.00	$ 95.58	5.9	1.4
348	$ 3,196,781	$ 182,404	$ 7,758,248	$ 322,494	12,851	$ 25.09	$ 14.19	$ 603.71	2.0	1.0
350	$ 3,048,189	$ 144,720	$ 175,657	$ 354,379	40,846	$ 8.68	$ 3.54	$ 4.30	2.0	0.3
353	$ 15,129,559	$ 657,456	$ 6,846,019	$ 1,494,400	61,424	$ 24.33	$ 10.70	$ 111.46	11.8	1.4
354	$ 13,355,741	$ 601,362	$ 17,771,699	$ 1,309,424	61,424	$ 21.32	$ 9.79	$ 289.33	11.8	1.4
358a	$ 3,309,357	$ 160,893	$ 3,976,927	$ 352,267	18,472	$ 19.07	$ 8.71	$ 215.29	2.0	0.3
358b	$ 3,309,357	$ 160,893	$ 3,976,927	$ 352,267	18,472	$ 19.07	$ 8.71	$ 215.29	2.0	0.3
358c	$ 3,309,357	$ 160,893	$ 3,976,927	$ 352,267	18,472	$ 19.07	$ 8.71	$ 215.29	2.0	0.3
477	$ 5,152,155	$ 253,409	$ 3,038,926	$ 507,227	87,316	$ 5.81	$ 2.90	$ 34.80	3.0	0.7
478	$ 4,362,688	$ 215,019	$ 912,482	$ 457,374	70,560	$ 6.48	$ 3.05	$ 12.93	3.0	0.7
480a	$ 10,844,657	$ 479,299	$ 1,924,063	$ 1,165,437	22,745	$ 51.24	$ 21.07	$ 84.59	11.8	1.2
480b	$ 10,844,657	$ 479,299	$ 2,084,059	$ 1,165,437	22,745	$ 51.24	$ 21.07	$ 91.63	11.8	1.2
490	$ 10,663,098	$ 477,047	$ 3,870,887	$ 1,154,525	44,048	$ 26.21	$ 10.83	$ 87.88	11.8	1.4
504	$ 8,584,774	$ 447,651	$ 2,552,652	$ 933,613	33,794	$ 27.63	$ 13.25	$ 75.54	11.8	2.8
600	$ 14,086,368	$ 658,085	$ 17,602,333	$ 1,420,381	61,361	$ 23.15	$ 10.72	$ 286.86	11.8	2.8
700	$ 4,260,135	$ 306,414	$ 1,545,265	$ 416,837	7,029	$ 59.30	$ 43.59	$ 219.84	11.8	2.8
701	$ 7,801,468	$ 369,832	$ 2,821,210	$ 846,286	20,115	$ 42.07	$ 18.39	$ 140.25	5.9	1.4
702a	$ 3,844,283	$ 186,398	$ 2,869,021	$ 394,811	24,094	$ 16.39	$ 7.74	$ 119.08	3.0	0.5
702b	$ 3,844,283	$ 186,398	$ 2,869,021	$ 394,811	24,094	$ 16.39	$ 7.74	$ 119.08	3.0	0.5
704	$ 2,218,575	$ 124,299	$ 347,418	$ 287,912	69,675	$ 4.13	$ 1.78	$ 4.99	2.0	1.0
705	$ 11,653,125	$ 538,357	$ 2,527,818	$ 1,098,977	13,457	$ 81.67	$ 40.01	$ 187.85	11.8	1.4
706	$ 4,046,145	$ 200,423	$ 1,479,415	$ 426,745	39,752	$ 10.74	$ 5.04	$ 37.22	3.0	0.7
707	$ 5,753,860	$ 267,052	$ 3,989,247	$ 579,970	161,640	$ 3.59	$ 1.65	$ 24.68	3.9	0.7
708	$ 2,763,186	$ 176,280	$ 1,393,159	$ 264,580	3,381	$ 78.25	$ 52.13	$ 412.01	2.0	1.0

TABLE 3-6c. SUMMARY OF BASELINE COSTS FOR GOVERNMENT INCINERATORS

Site ID	Capital Cost ($)	Fixed O&M Annual Cost ($)	Variable O&M Annual Cost ($)	Annualized Capital Cost ($)	HW Feed (ton/yr)	Annualized Capital Cost ($/ton/yr)	Fixed O&M Annual Cost ($/ton/yr)	Variable O&M Annual Cost ($/ton/yr)	Empl per Comb Sys	Empl per Facility (EPA ID)
347	$ 8,446,666	$ 452,794	$ 2,199,380	$ 901,688	50,216	$ 17.96	$ 9.02	$ 43.80	11.8	2.8
349a	$ 3,518,170	$ 183,867	$ 1,535,559	$ 387,172	4,828	$ 80.19	$ 38.08	$ 318.05	5.9	0.7
349b	$ 3,518,170	$ 183,867	$ 1,535,559	$ 387,172	4,828	$ 80.19	$ 38.08	$ 318.05	5.9	0.7
351	$ 3,248,949	$ 172,203	$ 524,019	$ 363,260	820	$ 442.82	$ 209.92	$ 638.79	5.9	0.7
357	$ 7,903,779	$ 443,819	$ 2,419,714	$ 775,898	11,863	$ 65.41	$ 37.41	$ 203.98	11.8	2.8
503	$ 3,376,357	$ 198,480	$ 352,971	$ 383,019	8,278	$ 46.27	$ 23.98	$ 42.64	5.9	1.4
727	$ 2,515,855	$ 144,614	$ 312,449	$ 284,257	368	$ 773.00	$ 393.26	$ 849.66	5.9	0.7

TABLE 3-6b. SUMMARY OF BASELINE COSTS FOR ON-SITE INCINERATORS

Site ID	Capital Cost ($)	Fixed O&M Annual Cost ($)	Variable O&M Annual Cost ($)	Annualized Capital Cost ($)	HW Feed (ton/yr)	Annualized Capital Cost ($/ton/yr)	Fixed O&M Annual Cost ($/ton/yr)	Variable O&M Annual Cost ($/ton/yr)	Empl per Comb Sys	Empl per Facility (EPA ID)
711	$ 14,086,620	$ 691,350	$ 1,966,620	$ 1,473,782	22,067	$ 66.79	$ 31.33	$ 89.12	11.8	3.7
712	$ 4,825,609	$ 292,872	$ 701,941	$ 575,329	106,423	$ 5.41	$ 2.75	$ 6.60	3.9	2.9
714a	$ 4,057,243	$ 202,061	$ 2,139,412	$ 439,169	14,804	$ 29.67	$ 13.65	$ 144.52	3.0	1.0
714b	$ 4,057,243	$ 202,061	$ 2,139,412	$ 439,169	14,804	$ 29.67	$ 13.65	$ 144.52	3.0	1.0
725	$ 1,578,253	$ 112,864	$ 295,273	$ 191,292	337	$ 566.98	$ 334.52	$ 875.18	2.0	1.0
726	$ 2,268,478	$ 149,622	$ 633,007	$ 254,333	6,160	$ 41.29	$ 24.29	$ 102.76	2.0	1.0
728a	$ 2,525,012	$ 132,926	$ 1,028,195	$ 278,619	8,646	$ 32.23	$ 15.37	$ 118.93	5.9	0.4
728b	$ 2,525,012	$ 132,926	$ 1,054,450	$ 278,619	8,646	$ 32.23	$ 15.37	$ 121.96	5.9	0.4
728c	$ 2,525,012	$ 132,926	$ 1,028,195	$ 278,619	8,646	$ 32.23	$ 15.37	$ 118.93	5.9	0.4
728d	$ 2,525,012	$ 132,926	$ 1,054,450	$ 278,619	8,646	$ 32.23	$ 15.37	$ 121.96	5.9	0.4
784	$ 1,850,152	$ 110,771	$ 198,252	$ 247,461	8,064	$ 30.69	$ 13.74	$ 24.58	2.0	1.0
805	$ 8,046,233	$ 376,494	$ 3,224,766	$ 848,317	65,592	$ 12.93	$ 5.74	$ 49.16	11.8	0.9
806	$ 9,831,649	$ 492,638	$ 4,832,817	$ 1,070,708	203,409	$ 5.26	$ 2.42	$ 23.76	11.8	2.8
808	$ 13,910,487	$ 651,551	$ 9,055,768	$ 1,363,202	57,770	$ 23.60	$ 11.28	$ 156.75	11.8	2.8
809	$ 10,249,831	$ 462,770	$ 1,975,918	$ 1,105,143	30,538	$ 36.19	$ 15.15	$ 64.70	11.8	1.4
810	$ 4,250,520	$ 229,236	$ 3,142,274	$ 429,523	40,135	$ 10.70	$ 5.71	$ 78.29	3.0	1.0
824	$ 1,833,448	$ 133,358	$ 261,023	$ 213,078	3,129	$ 68.09	$ 42.62	$ 83.41	2.0	1.0
904	$ 2,251,648	$ 141,864	$ 148,714	$ 291,543	7,207	$ 40.45	$ 19.69	$ 20.64	5.9	1.4
905	$ 1,941,306	$ 137,474	$ 1,447,728	$ 221,441	3,999	$ 55.38	$ 34.38	$ 362.05	2.0	1.0
906	$ 2,134,862	$ 133,405	$ 1,727,663	$ 250,215	4,172	$ 59.97	$ 31.97	$ 414.09	2.0	1.0
915a	$ 15,055,551	$ 640,270	$ 2,423,575	$ 1,603,158	87,884	$ 18.24	$ 7.29	$ 27.58	11.8	1.8
915b	$ 15,055,551	$ 640,270	$ 2,423,575	$ 1,603,158	87,884	$ 18.24	$ 7.29	$ 27.58	11.8	1.8

TABLE 3-6d. SUMMARY OF BASELINE COSTS FOR CEMENT KILNS

Site ID	Capital Cost ($)	Fixed O&M Annual Cost ($)	Variable O&M Annual Cost ($)	Annualized Capital Cost ($)	Primary Fuel Credit ($/yr)	HW Feed (ton/yr)	Annualized Capital Cost ($/ton/yr)	Fixed O&M Annual Cost ($/ton/yr)	Variable O&M Annual Cost ($/ton/yr)	Primary Fuel Credit ($/ton/yr)	HW Burning Penalty ($/ton/yr)	Empl per Comb Sys	Empl per Facility (EPA ID)
200	$ 2,617,827	$411,087	$ 2,044,110	$ 300,378	$(1,217,364)	50,088	$ 6.00	$ 8.21	$ 40.81	$ (24.30)	$ 11.39	3.0	1.2
201	$ 2,582,880	$409,690	$ 2,361,592	$ 295,641	$(1,149,671)	50,747	$ 5.83	$ 8.07	$ 46.54	$ (22.65)	$ 16.72	3.0	1.2
202	$ 4,006,988	$615,527	$ 2,373,578	$ 436,833	$(1,697,615)	62,434	$ 7.00	$ 9.86	$ 38.02	$ (27.19)	$ 11.39	15.8	5.0
203	$ 3,429,787	$592,439	$ 1,716,732	$ 378,339	$(1,023,807)	46,679	$ 8.11	$ 12.69	$ 36.78	$ (21.93)	$ 3.23	15.8	5.0
204	$ 5,547,258	$677,138	$ 2,738,607	$ 601,529	$(4,988,879)	153,439	$ 3.92	$ 4.41	$ 17.85	$ (32.51)	$ 3.23	15.8	5.0
205	$ 2,852,901	$470,115	$ 1,398,715	$ 322,787	$(1,170,068)	39,595	$ 8.15	$ 11.87	$ 35.33	$ (29.55)	$ 16.72	5.9	2.5
206	$ 4,254,438	$526,176	$ 2,619,377	$ 471,879	$(2,420,620)	102,293	$ 4.61	$ 5.14	$ 25.61	$ (23.66)	$ 11.39	7.9	2.5
207	$ 2,267,271	$446,690	$ 841,888	$ 262,828	$ (589,498)	21,933	$ 11.98	$ 20.37	$ 38.38	$ (26.88)	$ 16.72	3.9	2.5
208	$ 3,464,310	$494,571	$ 1,766,108	$ 386,207	$(1,688,965)	62,841	$ 6.15	$ 7.87	$ 28.10	$ (26.88)	$ 11.39	7.9	2.5
228	$ 4,526,705	$503,984	$ 2,163,470	$ 508,650	$(2,860,379)	111,878	$ 4.55	$ 4.50	$ 19.34	$ (25.57)	$ 3.23	3.9	1.7
300	$ 3,561,703	$498,467	$ 2,132,865	$ 400,320	$(1,383,224)	60,768	$ 6.59	$ 8.20	$ 35.10	$ (22.76)	$ 16.72	5.9	2.5
302a	$ 3,134,895	$481,394	$ 917,109	$ 362,096	$(1,280,053)	48,376	$ 7.48	$ 9.95	$ 18.96	$ (26.46)	$ 3.23	3.9	2.5
302b	$ 3,134,895	$481,394	$ 917,109	$ 362,096	$(1,280,053)	48,376	$ 7.48	$ 9.95	$ 18.96	$ (26.46)	$ 3.23	3.9	2.5
303	$ 4,802,670	$647,354	$ 3,464,397	$ 521,111	$(2,236,966)	96,389	$ 5.41	$ 6.72	$ 35.94	$ (23.21)	$ 16.72	15.8	5.0
304	$ 4,684,195	$642,615	$ 3,676,550	$ 515,210	$(3,057,835)	101,012	$ 5.10	$ 6.36	$ 36.40	$ (30.27)	$ 11.39	15.8	5.0
305	$ 3,030,323	$477,212	$ 1,596,683	$ 338,779	$(1,377,879)	44,304	$ 7.65	$ 10.77	$ 36.04	$ (31.10)	$ 16.72	7.9	2.5
318a	$ 3,340,364	$439,989	$ 1,645,850	$ 378,510	$(1,655,612)	61,600	$ 6.14	$ 7.14	$ 26.72	$ (26.88)	$ 12.68	3.0	1.2
318b	$ 3,340,364	$439,989	$ 1,645,850	$ 378,510	$(1,655,612)	61,600	$ 6.14	$ 7.14	$ 26.72	$ (26.88)	$ 12.68	3.0	1.2
318c	$ 3,340,364	$439,989	$ 1,645,850	$ 378,510	$(1,655,612)	61,600	$ 6.14	$ 7.14	$ 26.72	$ (26.88)	$ 12.68	3.0	1.2
319	$ 3,416,154	$591,894	$ 3,000,467	$ 376,519	$(2,682,527)	105,600	$ 3.57	$ 5.61	$ 28.41	$ (25.40)	$ 16.72	15.8	5.0
320	$ 3,555,703	$597,476	$ 3,867,563	$ 385,017	$(1,254,036)	49,971	$ 7.70	$ 11.96	$ 77.40	$ (25.10)	$ 53.54	15.8	5.0
321	$ 3,710,227	$603,656	$ 2,209,768	$ 402,293	$(1,502,034)	56,665	$ 7.10	$ 10.65	$ 39.00	$ (26.51)	$ 16.72	15.8	5.0
322	$ 2,985,943	$475,436	$ 1,487,136	$ 342,054	$(1,100,951)	44,566	$ 7.68	$ 10.67	$ 33.37	$ (24.70)	$ 16.72	3.9	2.5
323	$ 3,224,731	$484,988	$ 1,455,589	$ 366,654	$(1,307,422)	54,400	$ 6.74	$ 8.92	$ 26.76	$ (24.03)	$ 11.39	3.9	2.5
335	$ 2,326,127	$449,044	$ 746,037	$ 267,569	$ (564,068)	22,867	$ 11.70	$ 19.64	$ 32.62	$ (24.67)	$ 11.39	3.9	2.5
401	$ 3,438,662	$493,545	$ 2,054,921	$ 385,599	$(1,386,271)	54,771	$ 7.04	$ 9.01	$ 37.52	$ (25.31)	$ 16.72	5.9	2.5
402	$ 3,033,684	$477,346	$ 1,346,453	$ 339,777	$ (919,178)	38,817	$ 8.75	$ 12.30	$ 34.69	$ (23.68)	$ 11.39	5.9	2.5
403	$ 4,931,214	$520,164	$ 2,602,362	$ 551,965	$(2,784,482)	133,440	$ 4.14	$ 3.90	$ 19.50	$ (20.87)	$ 3.23	3.9	1.7
404	$ 3,932,389	$480,211	$ 2,312,425	$ 441,953	$(2,250,048)	80,765	$ 5.47	$ 5.95	$ 28.63	$ (27.86)	$ 11.39	3.9	1.7
473	$ 2,986,962	$425,853	$ 1,030,354	$ 339,523	$(1,542,205)	61,600	$ 5.51	$ 6.91	$ 16.73	$ (25.04)	$ 3.23	3.0	1.2
491	$ 3,835,931	$509,436	$ 2,473,016	$ 429,919	$(1,644,764)	72,258	$ 5.95	$ 7.05	$ 34.22	$ (22.76)	$ 16.72	5.9	2.5
680	$ 2,671,960	$413,253	$ 1,570,204	$ 305,649	$(1,270,499)	50,747	$ 6.02	$ 8.14	$ 30.94	$ (25.04)	$ 16.72	3.0	1.2
681	$ 2,653,883	$412,530	$ 1,535,773	$ 304,772	$(1,270,599)	50,751	$ 6.01	$ 8.13	$ 30.26	$ (25.04)	$ 16.72	2.0	1.2

TABLE 3-6e. SUMMARY OF BASELINE COSTS FOR LIGHTWEIGHT AGGREGATE KILNS

Site ID	Capital Cost ($)	Fixed O&M Annual Cost ($)	Variable O&M Annual Cost ($)	Annualized Capital Cost ($)	Primary Fuel Credit ($/yr)	HW Feed (ton/yr)	Annualized Capital Cost ($/ton/yr)	Fixed O&M Annual Cost ($/ton/yr)	Variable O&M Annual Cost ($/ton/yr)	Primary Fuel Credit ($/ton/yr)	Empl per Comb Sys	Empl per Facility (EPA ID)
225	$ 2,276,312	$ 565,880	$ 453,722	$ 261,687	$ (520,572)	16,247	$ 16.11	$ 34.83	$ 27.93	$ (32.04)	6.6	4.8
307	$ 2,766,651	$ 488,705	$ 495,018	$ 314,260	$ (631,510)	26,585	$ 11.82	$ 18.38	$ 18.62	$ (23.75)	3.3	2.4
311	$ 1,826,501	$ 418,836	$ 237,853	$ 212,990	$ (308,356)	10,603	$ 20.09	$ 39.50	$ 22.43	$ (29.08)	2.2	1.6
312	$ 1,880,821	$ 421,009	$ 254,701	$ 220,044	$ (469,329)	12,057	$ 18.25	$ 34.92	$ 21.12	$ (38.92)	2.2	1.6
313	$ 1,902,466	$ 454,137	$ 288,706	$ 223,138	$ (440,080)	11,678	$ 19.11	$ 38.89	$ 24.72	$ (37.68)	3.3	2.4
314	$ 2,008,970	$ 458,398	$ 318,533	$ 234,466	$ (624,203)	14,426	$ 16.25	$ 31.78	$ 22.08	$ (43.27)	3.3	2.4
336	$ 1,605,696	$ 410,004	$ 192,597	$ 189,363	$ (213,744)	6,798	$ 27.85	$ 60.31	$ 28.33	$ (31.44)	2.2	1.6
479	$ 2,485,474	$ 477,458	$ 414,432	$ 284,642	$ (592,809)	20,085	$ 14.17	$ 23.77	$ 20.63	$ (29.52)	3.3	2.4

TABLE 3-7. SITE-SPECIFIC INPUT CHARACTERISTICS FOR BASELINE COSTS

Site ID	Facility Type	Location	System Type	Existing APCD Sys	WHB	Flow, acfm (APCD T)	Flow, dscfm	Stk Temp, F	Stk H2O, Fraction	Stk O2, Fraction	Waste Capacity, lbs/hr	Natural Gas	Fuel Oil	Coal	None	Estimated Total Heat Input (INCs), MMBtu/hr	Total Heat Input, MMBtu/hr	Natural Gas Heat Input, MMBtu/hr
201	CK	STACK	Rotary Kiln	FF	No	159,349	66,867	427	0.28	0.10	13539			COAL			159.4	
201	CK	STACK	Rotary Kiln	FF	No	200,314	78,059	426	0.30	0.10	16493			COAL			172.7	
202	CK	STACK	Rotary Kiln	FF	No	309,540	199,344	272	0.06	0.17	20291			COAL			238.4	
203	CK	STACK	Rotary Kiln	ESP	No	305,036	117,978	387	0.31	0.08	18373			COAL			243.4	
204	CK	STACK	Rotary Kiln	ESP	No	930,667	320,470	506	0.30	0.08	56706			COAL			3152.4	
205	CK	STACK	Rotary Kiln	ESP	No	217,931	82,408	408	0.36	0.06	21182			COAL			308.6	
206	CK	STACK	Rotary Kiln	ESP	No	445,663	163,300	413	0.37	0.07	33245			COAL			531.5	
207	CK	STACK	Rotary Kiln	MC/ESP	No	90,744	44,085	313	0.25	0.11	7128			COAL			145.8	
208	CK	STACK	Rotary Kiln	ESP	No	300,031	139,707	304	0.29	0.10	20423			COAL			372.0	
209	CINC	STACK	Liquid Injection	WHB/FF/VQ/PT/DM	Yes	53,615	15,102	152	0.27	0.10	13200		FUEL OIL			47.8	149.8	
210	CINC	STACK	Rotary Kiln	SD/FF/PT	No	306,050	47,835	162	0.27	0.14	30978	NATURAL GAS				102.0	286.0	20.40
211	CINC	STACK	Rotary Kiln	SD/FF/PT	No	61,261	26,975	156	0.28	0.16	8552	NATURAL GAS				41.1	129.5	8.22
212	CINC	STACK	Rotary Kiln	SD/FF/PT	No	60,338	25,438	158	0.31	0.15	14820	NATURAL GAS				41.4	86.0	8.28
214	CINC	STACK	Rotary Kiln	Q/WS	No	33,900	29,593	311	0.06	0.11	26532	NATURAL GAS				88.5	218.0	17.70
216	CINC	STACK	Rotary Kiln	HES/WS	No	47,839	37,242	81	0.03	0.09	5812	NATURAL GAS				122.8	68.0	24.56
222	CINC	STACK	Rotary Kiln	WHB/SD/C/DESP/Q/PBS	Yes	125,299	55,315	193	0.28	0.13	33063			COAL		119.4	238.0	
225	LWAK	STACK	Rotary Kiln	FF	No	43,624	22,646	302	0.14	0.13	4431				NONE		48.9	
226	CK	STACK	Rotary Kiln	ESP	No	182,964	74,328	433	0.34	0.09	53591			COAL			440.4	
229	INC	STACK	Liquid Injection	WHB/ACS/HCS/CS	Yes	1,568	817	163	0.36	0.05	1036	NATURAL GAS				3.8	4.6	1.08
300	CK	STACK	Rotary Kiln	ESP	No	224,674	85,588	332	0.23	0.12	19750			COAL			267.3	
302a	CK	STACK	Rotary Kiln	ESP	No	53,603	20,830	356	0.38	0.10	19634				NONE		155.3	
302b	CK	STACK	Rotary Kiln	ESP	No	53,603	20,830	356	0.38	0.10	19634				NONE		155.3	
303	CK	STACK-Combined	Rotary Kiln	QC/FF	No	410,765	277,656	232	0.04	0.12	34328			COAL			556.8	
304	CK	STACK	Rotary Kiln	ESP	No	371,072	329,350	329	0.32	0.06	32642			COAL			600.7	
305	CK	STACK	Rotary Kiln	ESP	No	330,138	135,343	406	0.09	0.12	14399			COAL			204.0	
307	LWAK	STACK	Rotary Kiln	FF/VS	No	73,106	36,609	138	0.16	0.15	8640				NONE		59.4	
311	LWAK	STACK	Rotary Kiln	FF	No	55,813	31,744	346	0.06	0.17	3446				NONE		29.0	
312	LWAK	STACK	Rotary Kiln	FF	No	48,936	26,629	352	0.12	0.15	3919				NONE		44.1	
313	LWAK	STACK	Rotary Kiln	FF	No	39,434	21,356	342	0.10	0.15	3795				NONE		41.4	
314	LWAK	STACK	Rotary Kiln	FF	No	42,364	22,507	338	0.11	0.15	4060				NONE		58.7	
318a	CK	STACK	Rotary Kiln	ESP	No	163,846	59,882	366	0.39	0.06	20020			COAL			377.3	
318b	CK	STACK	Rotary Kiln	ESP	No	163,846	59,882	366	0.39	0.06	20020			COAL			377.3	
318c	CK	STACK	Rotary Kiln	ESP	No	163,846	59,882	366	0.39	0.06	20020			COAL			377.3	
319	CK	STACK	Rotary Kiln	ESP	No	353,253	122,147	511	0.34	0.05	34320			COAL			578.9	
320	CK	STACK	Rotary Kiln	FF	No	469,675	234,332	353	0.06	0.10	16241			COAL			418.2	
321	CK	STACK-Combined	Rotary Kiln	ESP	No	413,638	246,000	263	0.18	0.14	18416			COAL			346.0	
322	CK	STACK	Rotary Kiln	ESP	No	94,958	42,108	329	0.30	0.09	14484				NONE		133.6	
323	CK	STACK	Rotary Kiln	ESP	No	135,689	53,095	395	0.35	0.08	22049			COAL			245.0	
324	CINC	STACK	Two Chamber	WHB	Yes	12,083	6,139	438	0.34	0.12	854	NATURAL GAS				15.5	7.43	3.10
325	CINC	STACK	Rotary Kiln	SD/FF/WS/EWS	No	40,556	22,188	96	0.05	0.13	13573	NATURAL GAS				48.0	113.3	15.00
327	CINC	STACK	Rotary Kiln	SD/FF/WS/WESP	No	60,060	26,086	149	0.25	0.10	100461		FUEL OIL			82.0	251.2	
331	CINC	STACK	Rotary Kiln	Q/PT/WS/DM	No	50,310	35,856	122	0.11	0.11	24000		FUEL OIL			100.7	192.0	
333a	CINC	STACK	Rotary Kiln	SD/FF	No	44,438	15,859	361	0.42	0.12	19116		FUEL OIL			42.5	130.1	
333b	CINC	STACK	Rotary Kiln	SD/FF	No	44,438	15,859	361	0.42	0.12	19116		FUEL OIL			42.5	130.1	
334	INC	STACK	Rotary Kiln	WHB/Q/WS/WESP/PT/WS	Yes	50,078	39,235	76	0.02	0.14	23554	NATURAL GAS				79.5	254.9	15.90
335	CK	STACK	Rotary Kiln	ESP	No	122,399	56,417	377	0.23	0.11	7432			COAL			165.3	
336	LWAK	STACK	Rotary Kiln	FF	No	53,770	28,742	366	0.12	0.16	2209				NONE		20.1	
337a	INC	STACK	Two Chamber	WHB/DA/D/FF	Yes	16,232	9,160	326	0.08	0.16	1976	NATURAL GAS				11.8	23.4	9.56
337b	INC	STACK	Two Chamber	WHB/DA/D/FF	Yes	16,232	9,160	326	0.08	0.16	1976	NATURAL GAS				11.8	23.4	9.56
338	INC	STACK	Rotary Kiln	QC/FF/SS/C/HES/DM	No	94,375	43,482	166	0.24	0.10	36870	NATURAL GAS				130.7	239.1	16.00
340	INC	STACK	Fluidized Bed	WHB/ESP/WS	Yes	23,745	9,478	160	0.31	0.08	6629		FUEL OIL			34.8	83.1	
342	INC	STACK	Rotary Kiln	WHB/QC/S/VS/DM	Yes	6,559	5,084	115	0.03	0.12	2000	NATURAL GAS				12.8	16.8	2.57
347	GOV	STACK	Rotary Kiln	C/QT/VS/PBS/DM	No	24,121	10,373	238	0.48	0.09	16320		FUEL OIL			34.5	101.9	

TABLE 3-7. SITE-SPECIFIC INPUT CHARACTERISTICS FOR BASELINE COSTS

Site ID	Fuel Oil Heat Input, MMBtu/hr	Coal Heat Input, MMBtu/hr	Total Waste Heat Input, MMBtu/hr	HW Feed, lb/h	Tot-HW Feed, ton/yr	Liquid HW Feed, Fraction	Sludge HW Feed, Fraction	Solid HW Feed, Fraction	Liquid HW Heating Value, Btu/lb	Sludge HW Heating Value, Btu/lb	Solid HW Heating Value, Btu/lb	Fuel Oil Ash, Fraction	Coal Ash, Fraction	Waste Ash, Fraction	HW Feed Penalty, $/ton HWDF	ExistAPCDs Capital cost	ExistAPCDs Annualized capital cost ($/yr)	ExistAPCDs Fixed annual O&M costs ($/yr)
200		11.70	347.74	12,522	50,088	0.14	0.00	0.86	13047	12867	11602		0.00	0.00	11.39	$ 1,420,163	$ 125,380	$ 216,752
201		33.15	339.52	12,687	50,747	0.14	0.00	0.86	13047	12867	10756		0.00	0.00	16.72	$ 1,766,651	$ 155,857	$ 243,638
202		32.37	206.02	15,608	62,434	0.70	0.00	0.30	14983	12867	9102		0.03	0.01	11.39	$ 2,740,993	$ 241,891	$ 317,428
203		119.17	324.25	11,620	46,479	0.50	0.00	0.50	13047	12867	8247		0.00	0.00	3.23	$ 5,330,088	$ 503,129	$ 317,712
204		547.00	605.45	38,360	153,439	1.00	0.00	0.00	15783	12867	8247		0.04	0.00	3.23	$ 13,651,126	$ 1,288,591	$ 710,797
205		166.64	142.00	9,899	39,595	1.00	0.00	0.00	14345	12867	8247		0.04	0.00	16.72	$ 4,014,344	$ 378,931	$ 255,557
206		247.77	293.76	25,573	102,293	1.00	0.00	0.00	11487	12867	8247		0.04	0.00	11.39	$ 7,282,068	$ 687,377	$ 409,924
207		74.25	71.54	5,483	21,933	1.00	0.00	0.00	13047	12867	8247		0.00	0.00	16.72	$ 2,119,703	$ 200,085	$ 166,054
208		167.08	204.97	15,710	62,841	1.00	0.00	0.00	13047	12867	8247		0.00	0.00	11.39	$ 5,256,258	$ 496,151	$ 334,225
209	9.56		140.26	12,881	51,560	1.00	0.00	0.00	10924	6269	6544	0.00		0.03		$ 998,347	$ 118,794	$ 383,505
210			265.63	30,694	120,375	0.46	0.19	0.36	11574	10014	4695			0.27		$ 2,764,834	$ 303,363	$ 450,776
211			121.28	8,428	33,712	1.00	0.00	0.00	14391	6269	6544			0.12		$ 1,683,410	$ 188,488	$ 386,697
212			77.74	14,626	58,504	0.19	0.08	0.72	12891	9442	2823			0.72		$ 1,757,019	$ 196,551	$ 390,651
214			200.28	22,778	91,112	0.63	0.06	0.32	8956	5480	9027			0.10		$ 1,190,883	$ 359,715	$ 167,632
216			43.48	5,743	22,972	0.49	0.19	0.32	8763	6269	6544			0.10		$ 921,488	$120,343	$ 261,795
222		9.48	278.56	27,730	110,919	0.96	0.03	0.02	8429	6269	6544		0.00	0.03		$ 5,140,981	$ 549,338	$ 576,970
225			48.93	4,062	16,247	1.00	0.00	0.00	12046					0.00		$ 305,424	$ 26,458	$ 135,242
228		93.28	147.13	27,969	111,878	0.83	0.00	0.19	13543	12867	7669		0.00	0.00	3.23	$ 3,464,008	$ 326,980	$ 229,559
229			3.63	880	3,521	1.00	0.00	0.00	4123	6269	6544			0.00		$ 233,188	$ 26,507	$ 120,451
300		99.48	167.87	15,192	60,768	0.86	0.00	0.14	11653	12867	7291		0.00	0.00	16.72	$ 4,118,816	$ 388,790	$ 260,492
302a			155.35	12,094	48,376	1.00	0.00	0.00	12845	12867	8247			0.00	3.23	$ 1,523,299	$ 143,790	$ 137,880
302b			155.35	12,094	48,376	1.00	0.00	0.00	12845	12867	8247			0.00	3.23	$ 1,523,299	$ 143,790	$ 137,880
303		285.30	271.48	24,097	96,389	0.90	0.00	0.10	14412	12867	9954		0.00	0.00	16.72	$ 9,565,736	$ 891,393	$ 924,452
304		229.61	371.10	25,253	101,012	0.55	0.00	0.45	16800	12867	12160		0.06	0.05	11.39	$ 6,287,649	$ 593,507	$ 362,947
305		36.77	167.22	11,076	44,304	1.00	0.00	0.00	15097	12867	8247		0.09	0.01	16.72	$ 5,697,572	$ 537,807	$ 335,072
307			59.35	6,646	26,585	0.94	0.00	0.06	9550					0.00		$ 1,220,981	$ 133,792	$ 323,826
311			28.98	2,651	10,603	1.00	0.00	0.00	10933					0.00		$ 381,175	$ 32,944	$ 142,159
312			44.11	3,014	12,057	1.00	0.00	0.00	14633					0.00		$ 338,317	$ 29,272	$ 138,253
313			41.36	2,920	11,678	1.00	0.00	0.00	14167					0.00		$ 279,471	$ 24,237	$ 132,862
314			58.67	3,606	14,426	1.00	0.00	0.00	16267					0.00		$ 297,648	$ 25,792	$ 134,530
318a		176.33	200.92	15,400	61,600	1.00	0.00	0.00	13047	12867	8247		0.00	0.00	12.68	$ 3,156,228	$ 297,923	$ 215,020
318b		176.33	200.92	15,400	61,600	1.00	0.00	0.00	13047	12867	8247		0.00	0.00	12.68	$ 3,156,228	$ 297,923	$ 215,020
318c		176.33	200.92	15,400	61,600	1.00	0.00	0.00	13047	12867	8247		0.00	0.00	12.68	$ 3,156,228	$ 297,923	$ 215,020
319		253.38	325.55	26,400	105,600	0.34	0.60	0.06	12414	12867	6805		0.11	0.05	16.72	$ 6,032,108	$ 569,385	$ 350,876
320		266.02	152.19	12,493	49,971	1.00	0.00	0.00	13382	12867	8247		0.00	0.00	53.54	$ 4,296,375	$ 380,003	$ 430,687
321		163.67	182.29	14,166	56,665	1.00	0.00	0.00	[illegible]	12867	8247		0.00	0.00	16.72	$ 13,780,995	$ 1,300,845	$ 782,852
322			133.61	11,141	44,566	0.98	0.00	0.02	12089	12867	7672			0.00	16.72	$ 2,140,957	$ 205,865	$ 168,948
323		86.38	158.67	13,600	54,400	0.99	0.00	0.01	13701	12867	7899		0.00	0.00	11.39	$ 2,692,317	$ 254,139	$ 193,105
324			4.33	622	2,488	0.00	0.00	1.00	8763	6269	6968			0.00		$ -	$ -	$ -
325			98.27	10,899	43,596	0.44	0.26	0.30	11814	7168	6544			0.18		$ 2,593,141	$ 320,424	$ 506,762
327	3.79		247.43	41,126	164,504	0.56	0.05	0.39	6736	6269	4949			0.00		$ 3,458,212	$ 358,130	$ 537,453
331	20.15		171.81	22,694	90,775	0.49	0.19	0.32	8763	6269	6544	0.01		0.10		$ 1,850,268	$ 252,399	$ 280,215
333a	8.50		121.61	19,116	76,465	0.17	0.07	0.76	3770	10467	6544	0.01		0.00		$ 651,143	$ 64,293	$ 220,688
333b	8.50		121.61	19,116	76,465	0.17	0.07	0.76	3770	10467	6544	0.01		0.00		$ 651,143	$ 64,293	$ 220,688
334			239.03	22,466	89,863	0.20	0.10	0.70	10979	10994	10493			0.00		$ 2,148,487	$ 224,847	$ 278,420
335		96.89	68.45	5,717	22,867	1.00	0.00	0.00	11974	12867	8247		0.11	0.03	11.39	$ 2,557,624	$ 241,422	$ 186,742
336			20.09	1,700	6,798	1.00	0.00	0.00	12820					0.00		$ 368,392	$ 31,847	$ 140,995
337a			13.81	1,840	7,359	0.00	0.00	1.00	8763	6269	7509			0.02		$ 146,332	$ 13,051	$ 186,193
337b			13.81	1,840	7,359	0.00	0.00	1.00	8763	6269	7509			0.02		$ 146,332	$ 13,051	$ 186,193
338			263.13	33,798	135,190	0.59	0.21	0.21	8763	6269	6544			0.33		$ 1,467,564	$ 159,854	$ 341,131
340	6.95		36.18	6,594	26,375	0.05	0.60	0.35	12448	8956	10599	0.00		0.43		$ 1,389,274	$ 144,912	$ 241,831
342			14.24	1,530	6,118	0.49	0.19	0.32	12332	6269	6544			0.00		$ 396,399	$ 49,023	$ 236,868
343	6.90		95.04	12,554	50,216	0.49	0.19	0.32	8763	6269	6544	0.01		0.05		$ 637,873	$ 81,747	$ 248,395

TABLE 3-7. SITE-SPECIFIC INPUT CHARACTERISTICS FOR BASELINE COSTS

Site ID	ExisAPCDs Variable annual O&M costs ($/ton/yr)	#Consb Sys per EPA ID	(Waste Heat Input)/ (Total Heat Input), CKs Only	#Tested Units per EPA ID
200	$ 3	4	0.91	4
201	$ 3	4	0.81	4
202	$ 5	1	0.86	1
203	$ 4	1	0.56	1
204	$ 4	1	0.56	1
205	$ 4	2	0.58	2
206	$ 3	2	0.54	2
207	$ 3	2	0.49	2
208	$ 3	2	0.55	2
209	$ 108	1		1
210	$ 61	3		3
211	$ 823	3		3
212	$ 92	3		3
214	$ 319	1		1
216	$ 56	1		1
222	$ 121	1		1
225	$ 2	1		1
228	$ 1	3	0.85	3
229	$ 445	1		1
300	$ 3	2	0.63	2
302a	$ 1	2	1.00	1
302b	$ 1	2	1.00	1
303	$ 9	1	0.49	1
304	$ 2	1	0.62	1
305	$ 5	2	0.82	2
307	$ 36	2		2
311	$ 5	3		3
312	$ 4	3		3
313	$ 3	2		2
314	$ 3	2		2
318a	$ 2	4	0.05	2
318b	$ 2	4	0.05	2
318c	$ 2	4	0.05	2
319	$ 2	1	0.56	1
320	$ 9	1	0.36	1
321	$ 11	1	0.53	1
322	$ 2	2	1.00	2
323	$ 2	2	0.70	2
324	$	3		1
325	$ 254	1		1
327	$ 39	1		1
331	$ 106	1		1
333a	$ 13	3		2
333b	$ 13	3		2
334	$ 18	1		1
335	$ 4	2	0.41	2
336	$ 7	3		3
337a	$ 3	2		1
337b	$ 3	2		1
338	$ 5	3		1
340	$ 14	1		1
342	$ 38	1		1
347	$ 16	1		1

TABLE 3-7. SITE-SPECIFIC INPUT CHARACTERISTICS FOR BASELINE COSTS

Site ID	Facility Type	Location	System Type	Existing APCD Sys	WHB	Flow, acfm (APCD T)	Flow, dscfm	Stk Temp, F	Stk H2O, Fraction	Stk O2, Fraction	Waste Capacity, lbs/hr	Natural Gas	Fuel Oil	Coal	None	Estimated Total Heat Input (INCs), MMBtu/hr	Total Heat Input, MMBtu/hr	Natural Gas Heat Input, MMBtu/hr
348	INC	STACK	Liquid Injection	QC/AS/WS	No	8,031	6,227	92	0.05	0.12	3213		FUEL OIL			15.4	30.1	
349a	GOV	STACK	Rotary Kiln	QC/FF/QC/PT	No	7,171	2,589	191	0.45	0.14	251	NATURAL GAS				5.1	8.6	1.02
349b	GOV	STACK	Rotary Kiln	QC/FF/QC/PT	No	7,171	2,589	191	0.45	0.14	251	NATURAL GAS				5.1	8.6	1.02
350	INC	STACK	Liquid Injection	WHB/HE/FF	Yes	17,936	9,477	332	0.14	0.08	11586	NATURAL GAS				36.6	64.8	7.32
351	GOV	STACK	Rotary Kiln	GC/C/FF	No	4,455	2,988	206	0.07	0.35	300		FUEL OIL			5.3	6.7	
353	INC	STACK	Rotary Kiln	QC/VS/DM/WESP	No	43,035	33,627	97	0.02	0.11	28401		FUEL OIL			95.6	79.2	
354	INC	STACK	Rotary Kiln	QC/AS/VS/DM/IWS	No	38,770	25,359	140	0.18	0.11	18264		FUEL OIL			75.3	129.2	
357	GOV	STACK	Rotary Kiln	QC/VS/PT/IWS	No	20,868	9,393	176	0.45	0.12	3020	NATURAL GAS				24.2	29.0	4.83
358a	INC	STACK	Liquid Injection	QC/VS/C/CT/S/DM	No	13,957	5,739	181	0.49	0.07	8708	NATURAL GAS				23.7	31.5	4.74
358b	INC	STACK	Liquid Injection	QC/VS/C/CT/S/DM	No	13,957	5,739	181	0.49	0.07	8708	NATURAL GAS				23.7	31.5	4.74
358c	INC	STACK	Liquid Injection	QC/VS/C/CT/S/DM	No	13,957	5,739	181	0.49	0.07	8708	NATURAL GAS				23.7	31.5	4.74
359	CINC	STACK	Rotary Kiln	WHB/FF/S	Yes	22,954	11,915	138	0.16	0.13	3590	NATURAL GAS				26.4	27.2	5.28
401	CK	STACK	Rotary Kiln	ESP	No	209,574	101,823	266	0.23	0.13	25905			COAL			249.5	
402	CK	STACK-MAIN	Rotary Kiln	ESP	No	218,790	123,677	287	0.24	0.05	24122			COAL			183.2	
403	CK	STACK	Rotary Kiln	ESP	No	232,804	88,720	413	0.40	0.07	43368			COAL			442.2	
404	CK	STACK	Rotary Kiln	ESP	No	278,375	93,818	489	0.38	0.04	27606			COAL			454.6	
473	CK	STACK	Rotary Kiln	ESP	No	170,156	61,580	367	0.40	0.06	20020			COAL			199.2	
477	INC	STACK	Liquid Injection	QT/PT/VS/DM	No	42,926	16,480	482	0.52	0.07	28963	NATURAL GAS				66.9	221.0	50.39
478	INC	STACK	Liquid Injection	QT/QS/VS/ES/DM	No	38,317	12,330	887	0.60	0.06	30763	NATURAL GAS				54.5	144.4	10.90
479	EWAK	STACK	Rotary Kiln	MC/HB/FF/VS/DM	No	59,638	30,589	139	0.16	0.15	6971		FUEL OIL				166.3	
480a	INC	STACK	Rotary Kiln	QC/HS	No	47,765	17,143	486	0.55	0.06	7392	NATURAL GAS				72.6	57.6	14.52
480b	INC	STACK	Rotary Kiln	QC/HS	No	47,765	17,143	486	0.55	0.06	7392		FUEL OIL			72.6	57.6	
486	CINC	STACK	Rotary Kiln	VQC/PT/ES	No	28,619	17,214	468	0.25	0.07	15946	NATURAL GAS				68.4	112.1	13.67
487	CINC	STACK	Rotary Kiln	WS	No	57,638	34,429	468	0.25	0.07	31892	NATURAL GAS				136.7	224.2	27.35
490	INC	STACK	Rotary Kiln	SS/PBS	No	26,532	17,214	468	0.25	0.07	14316	NATURAL GAS				68.4	130.5	13.67
491	CK	STACK	Rotary Kiln	ESP	No	220,753	92,067	381	0.30	0.09	19750			COAL			299.1	
503	GOV	STACK	Rotary Kiln	QC/FF	No	4,864	3,265	236	0.05	0.16	2169		FUEL OIL			4.2	18.1	
504	INC	STACK	Fluidized Bed	VS/C	No	32,629	16,106	171	0.41	0.13	8779		FUEL OIL			37.7	32.2	
600	INC	STACK	Rotary Kiln	WHB/QC/PT/IWS	Yes	38,510	23,584	148	0.23	0.08	19942	NATURAL GAS				86.5	139.2	17.29
601	CINC	STACK	Rotary Kiln	WHB/DS/FF/WS	Yes	133,763	48,112	168	0.45	0.09	86926	NATURAL GAS				159.0	477.9	31.80
603	CINC	STACK	Rotary Kiln	QT/S/IWS	No	64,931	42,423	137	0.20	0.07	37315		FUEL OIL			169.7	285.5	
609	CINC	STACK	Rotary Kiln	SS/PT/VS/DM	No	104,834	81,705	108	0.03	0.08	45308	NATURAL GAS				305.3	382.2	61.06
632	CINC	STACK	Rotary Kiln	SD/FF	No	17,735	5,838	349	0.47	0.10	19116		FUEL OIL			18.3	40.4	
680	CK	STACK	Rotary Kiln	FF	No	157,802	75,062	351	0.23	0.11	13614			COAL			308.0	
681	CK	STACK	Rotary Kiln	FF	No	139,440	62,042	396	0.24	0.13	13614			COAL			166.2	
700	INC	STACK	Two Chamber	SD/RJS/VS/WS	No	31,478	13,464	178	0.48	0.11	2342		FUEL OIL			39.8	32.8	
701	INC	STACK	Rotary Kiln	VS/PT	No	13,423	10,457	77	0.03	0.10	6537		FUEL OIL			32.6	44.6	
702a	INC	STACK	Liquid Injection	QT/S/C	No	35,732	11,489	186	0.60	0.05	7008	NATURAL GAS				53.8	45.1	10.77
702b	INC	STACK	Liquid Injection	QT/S/C	No	35,732	11,489	186	0.60	0.05	7008	NATURAL GAS				53.8	45.1	10.77
704	INC	STACK	Liquid Injection	WHB	Yes	5,697	2,258	556	0.24	0.08	18053	NATURAL GAS				8.6	40.8	9.82
705	INC	STACK	Rotary Kiln	QT/VS/PT/WESP	No	36,836	18,288	163	0.41	0.10	3633	NATURAL GAS				55.0	46.7	11.01
706	INC	STACK	Liquid Injection	QT/HS/C/DM	No	35,243	10,717	191	0.62	0.03	15900	NATURAL GAS				55.9	77.5	11.19
707	INC	STACK	Liquid Injection	QS/QC/WS	No	66,022	21,017	186	0.60	0.05	40710	NATURAL GAS				95.9	256.7	19.18
708	INC	STACK	Liquid Injection	VS/PT/WESP	No	5,224	2,982	164	0.35	0.12	853	NATURAL GAS				7.4	9.2	1.48
711	INC	STACK	Rotary Kiln	C/WHB/VS/AS	Yes	61,815	27,613	177	0.44	0.08	7172	NATURAL GAS				102.6	81.4	20.51
712	INC	STACK	Liquid Injection	WHB	Yes	70,965	21,172	706	0.34	0.05	34587		FUEL OIL			96.0	220.6	
714a	INC	STACK	Liquid Injection	PBS	No	22,753	16,433	117	0.10	0.11	4740	NATURAL GAS				49.0	52.7	16.00
714b	INC	STACK	Liquid Injection	PBS	No	22,753	16,433	117	0.10	0.11	4740	NATURAL GAS				49.0	52.7	16.00
725	INC	STACK	Liquid Injection	WS/QT	No	1,934	998	165	0.36	0.09	85	NATURAL GAS				3.4	1.4	0.68
726	INC	STACK	Liquid Injection	QC/CS/DM/VS	No	4,111	3,141	139	0.04	0.13	2002	NATURAL GAS				7.6	20.2	1.52
727	GOV	STACK	Rotary Kiln	GC/C/FF	No	3,143	2,686	150	0.03	0.18	178	NATURAL GAS				2.4	1.1	0.47
728a	INC	STACK	Two Chamber	QT/PT/VS	No	6,225	3,980	157	0.20	0.10	2187	NATURAL GAS				12.2	9.8	2.43
728b	INC	STACK	Two Chamber	QT/PT/VS	No	6,225	3,980	157	0.20	0.10	2187		FUEL OIL			12.2	9.8	

TABLE 3-7. SITE-SPECIFIC INPUT CHARACTERISTICS FOR BASELINE COSTS

Site ID	Fuel Oil Heat Input, MMBtu/hr	Coal Heat Input, MMBtu/hr	Total Waste Heat Input, MMBtu/hr	HW Feed, lb/h	Tot-HW Feed, ton/yr	Liquid HW Feed, Fraction	Sludge HW Feed, Fraction	Solid HW Feed, Fraction	Liquid HW Heating Value, Btu/lb	Sludge HW Heating Value, Btu/lb	Solid HW Heating Value, Btu/lb	Fuel Oil Ash, Fraction	Coal Ash, Fraction	Waste Ash, Fraction	HW Feed Penalty, $/ton HWDF	ExisAPCDs Capital cost	ExisAPCDs Annualized capital cost ($/yr)	ExisAPCDs Fixed annual O&M costs ($/yr)
348	5.69		25.38	3,213	12,851	1.00	0.00	0.00	7899	6269	6544	0.00		0.00		$ 663,290	$ 86,847	$ 221,833
349a			7.57	1,207	4,828	0.00	1.00	0.00	8763	6269	6544			0.00		$ 395,547	$ 44,401	$ 239,199
349b			7.57	1,207	4,828	0.00	1.00	0.00	8763	6269	6544			0.00		$ 395,547	$ 44,401	$ 239,199
350			57.43	10,214	40,846	0.61	0.39	0.00	5741	5442	6544			0.00		$ 148,706	$ 13,061	$ 120,786
351	5.36		5.36	205	820	0.00	0.00	1.00	8763	6269	6544			0.00		$ 287,458	$ 30,271	$ 152,829
353	19.12		60.03	15,356	61,424	0.49	0.19	0.32	2943	6269	3944	0.01		0.09		$ 1,880,787	$ 193,583	$ 292,322
354	25.88		103.28	15,356	61,424	0.22	0.14	0.65	9165	3732	6544	0.00		0.03		$ 1,787,443	$ 244,291	$ 384,267
357			24.15	2,966	11,863	0.62	0.06	0.33	9851	6269	6544			0.11		$ 1,240,667	$ 167,843	$ 358,000
358a			26.78	4,618	18,472	1.00	0.00	0.00	5799	6269	6544			0.05		$ 504,647	$ 63,665	$ 242,057
358b			26.78	4,618	18,472	1.00	0.00	0.00	5799	6269	6544			0.05		$ 504,647	$ 63,665	$ 242,057
358c			26.78	4,618	18,472	1.00	0.00	0.00	5799	6269	6544			0.05		$ 504,647	$ 63,665	$ 242,057
359			21.88	2,464	9,856	0.66	0.34	0.00	10286	6269	6544			0.04		$ 647,476	$ 73,371	$ 255,986
401		81.28	168.24	13,693	54,771	0.76	0.00	0.24	13521	12867	8445		0.00	0.00	16.72	$ 3,884,169	$ 366,633	$ 249,402
402		78.67	111.55	9,704	38,817	0.75	0.00	0.25	12755	12867	7696		0.00	0.00	11.39	$ 4,027,683	$ 380,185	$ 256,187
403		104.26	337.92	33,360	133,440	0.78	0.00	0.22	10663	12867	8273		0.00	0.00	3.23	$ 4,233,364	$ 399,604	$ 265,903
404		161.55	273.06	20,193	80,765	0.60	0.00	0.20	15405	12867	6035		0.00	0.00	11.39	$ 4,940,506	$ 466,348	$ 299,309
475		82.00	187.16	15,400	61,600	0.48	0.35	0.17	13043	12867	8247		0.02	0.00	3.23	$ 3,258,404	$ 307,571	$ 219,846
477			130.59	21,829	87,316	1.00	0.00	0.00	7855	6269	6544			0.01		$ 864,338	$ 112,558	$ 259,102
478			133.55	17,640	70,560	0.49	0.19	0.32	8763	6269	6544			0.00		$ 525,129	$ 64,597	$ 162,398
479	161.63		55.72	5,021	20,085	0.94	0.00	0.06	12820			0.00		0.00		$ 1,062,553	$ 116,938	$ 312,760
480a			43.05	5,686	22,745	0.49	0.19	0.32	8763	6269	6544			0.05		$ 581,878	$ 71,999	$ 165,002
480b	14.52		43.05	5,686	22,745	0.49	0.19	0.32	8763	6269	6544	0.01		0.05		$ 581,878	$ 71,999	$ 165,002
486			98.41	12,366	49,065	0.68	0.10	0.22	8763	6269	6544			0.00		$ 696,254	$ 89,684	$ 232,162
487			196.81	24,533	98,130	0.68	0.10	0.22	8763	6269	6544			0.00		$ 745,499	$ 94,615	$ 246,414
490			116.86	11,012	44,048	0.63	0.00	0.37	12960	6269	6544			0.09		$ 499,767	$ 61,887	$ 133,974
491		99.48	199.61	18,065	72,258	0.86	0.00	0.14	11653	12867	7291		0.00	0.00	16.72	$ 4,058,134	$ 383,056	$ 257,626
503	0.85		17.22	2,070	8,278	0.60	0.00	0.40	8763	6269	6544	0.03		0.00		$ 291,559	$ 30,662	$ 153,151
504	24.39		7.83	8,448	33,794	0.00	1.00	0.00	8763	927	6544	0.00		0.52		$ 490,444	$ 60,086	$ 160,802
600			121.92	15,340	61,364	0.53	0.00	0.47	9199	6269	6544			0.00		$ 1,566,270	$ 212,820	$ 266,241
601			446.09	66,866	267,465	0.32	0.11	0.57	8,063	3,087	6544			0.79		$ 2,472,638	$ 270,554	$ 438,693
603	33.94		251.53	28,704	114,815	1.00	0.00	0.00	8763	6269	6544	0.00		0.00		$ 2,167,013	$ 296,518	$ 295,805
609			321.46	34,852	139,408	0.64	0.09	0.27	11382	6269	4959			0.00		$ 1,522,394	$ 202,214	$ 290,113
612	3.66		36.78	5,781	23,126	0.17	0.07	0.76	3770	10467	6544	0.01		0.00		$ 357,522	$ 36,017	$ 198,346
680		153.81	154.19	12,687	50,747	0.48	0.35	0.17	13047	12867	8247		0.02	0.00	16.72	$ 1,406,403	$ 124,370	$ 245,677
681		12.00	154.20	12,688	50,751	0.48	0.35	0.17	13047	12867	8247		0.02	0.00	16.72	$ 1,254,091	$ 110,789	$ 203,731
700	6.99		25.78	3,757	7,029	0.64	0.00	0.36	18632	6269	7615	0.00		0.01		$ 868,948	$ 109,494	$ 326,465
701	6.51		38.07	5,029	20,115	0.49	0.19	0.32	8763	6269	6544	0.01		0.05		$ 497,270	$ 62,665	$ 241,705
702a			34.32	6,024	24,094	1.00	0.00	0.00	5698	6269	6544			0.00		$ 576,544	$ 72,110	$ 137,862
702b			34.32	6,024	24,094	1.00	0.00	0.00	5698	6269	6544			0.00		$ 576,544	$ 72,110	$ 137,862
704			30.94	17,419	69,675	1.00	0.00	0.00	1776	6269	6544			0.00		$ -	$ -	$ -
705			35.70	3,364	13,457	0.63	0.00	0.37	12960	6269	6544			0.09		$ 1,996,628	$ 216,454	$ 378,585
706			66.32	9,938	39,752	1.00	0.00	0.00	6673	6269	6544			0.06		$ 506,441	$ 62,164	$ 161,539
707			237.56	40,410	161,640	1.00	0.00	0.00	5879	6269	6544			0.02		$ 806,771	$ 102,777	$ 149,316
708			2.67	845	3,381	1.00	0.00	0.00	9077	6269	6544			0.04		$ 757,119	$ 82,529	$ 319,815
711			60.86	5,517	22,067	0.42	0.00	0.58	12836	6269	9734			0.18		$ 1,083,332	$ 142,435	$ 269,374
712	19.20		201.43	26,606	106,423	0.49	0.19	0.32	8763	6269	6544	0.00		0.01		$ -	$ -	$ -
714a			36.75	3,701	14,804	1.00	0.00	0.00	9929	6269	6544			0.00		$ 466,672	$ 57,484	$ 132,298
714b			36.75	3,701	14,804	1.00	0.00	0.00	9929	6269	6544			0.00		$ 466,672	$ 57,484	$ 132,298
725			0.74	84	337	1.00	0.00	0.00	8763	6269	6544			0.00		$ 239,681	$ 27,362	$ 120,782
726			18.66	1,540	6,160	0.49	0.19	0.32	18100	6269	6544			0.00		$ 355,740	$ 43,546	$ 234,903
727			0.60	92	368	0.00	0.00	1.00	8763	6269	6544			0.00		$ 273,918	$ 28,976	$ 151,778
728a			7.35	2,161	8,646	1.00	0.00	0.00	3402	6269	6544			0.01		$ 391,078	$ 48,305	$ 236,612
728b	2.43		7.35	2,161	8,646	1.00	0.00	0.00	3402	6269	6544	0.00		0.01		$ 391,078	$ 48,305	$ 236,612

TABLE 3-7. SITE-SPECIFIC INPUT CHARACTERISTICS FOR BASELINE COSTS

Site ID	ExisAPCDs Variable annual O&M costs ($/ton/yr)	#Comb Sys per EPA ID	(Waste Heat Input)/ (Total Heat Input), CKs Only	#Tested Units per EPA ID
348	$ 574	1		1
349a	$ 247	2		1
349b	$ 247	2		1
350	$ 0	4		3
351	$ 7	2		2
353	$ 67	2		2
354	$ 254	2		2
357	$ 118	1		1
358a	$ 190	3		1
358b	$ 190	3		1
358c	$ 190	3		1
359	$ 52	1		1
401	$ 3	2	0.75	2
402	$ 4	2	0.75	2
403	$ 1	3	0.76	3
404	$ 2	3	0.68	3
473	$ 2	4	1.00	2
477	$ 14	3		3
478	$ 5	3		3
479	$ 44	2		2
480a	$ 24	3		2
480b	$ 24	3		2
486	$ 3	2		2
487	$ 1	2		2
490	$ 45	2		2
491	$ 2	2	0.63	2
503	$ 1	1		1
504	$ 4	1		1
600	$ 275	1		1
601	$ 1	1		1
603	$ 1	1		1
609	$ 15	1		1
642	$ 19	3		2
680	$ 3	4	0.45	4
681	$ 2	4	1.00	4
700	$ 105	1		1
701	$ 96	1		1
702a	$ 98	4		3
702b	$ 98	4		3
704	$ -	1		1
705	$ 94	2		2
706	$ 12	3		2
707	$ 15	4		3
708	$ 351	1		1
731	$ 21	1		1
732	$ -	1		1
734a	$ 99	2		1
734b	$ 99	2		1
725	$ 457	1		1
726	$ 74	1		1
727	$ 11	2		2
728a	$ 77	4		1
728b	$ 77	4		1

TABLE 3-7 SITE-SPECIFIC INPUT CHARACTERISTICS FOR BASELINE COSTS

Site ID	Facility Type	Location	System Type	Existing APCD Sys	WHB	Flow, acfm (APCD Ty	Flow, dscfm	Stk Temp, F	Stk H2O, Fraction	Stk O2, Fraction	Waste Capacity, lbs/hr	Natural Gas	Fuel Oil	Coal	None	Estimated Total Heat Input (INCs), MMBtu/hr	Total Heat Input, MMBtu/hr	Natural Gas Heat Input, MMBtu/hr
728c	INC	STACK	Two Chamber	QT/PT/VS	No	6,225	3,980	157	0.20	0.10	2187	NATURAL GAS				12.2	9.8	2.43
728d	INC	STACK	Two Chamber	QT/PT/VS	No	6,225	3,980	157	0.20	0.10	2187		FUEL OIL			12.2	9.8	
784	INC	STACK	Liquid Injection	NONE	No	14,481	2,781	1,775	0.21	0.07	2621	NATURAL GAS				11.1	19.9	2.21
805	INC	STACK	Rotary Kiln	QT/QS/VS/ES/PBS	No	24,927	7,736	189	0.61	0.05	17418	NATURAL GAS				35.4	193.3	49.54
806	INC	STACK	Fluidized Bed	C/VS	No	32,811	18,597	155	0.29	0.14	62035		FUEL OIL			39.1	175.4	
808	INC	STACK	Rotary Kiln	QT/PBS/VESP	No	41,204	24,333	143	0.26	0.30	14690	NATURAL GAS				76.6	111.6	15.32
809	INC	STACK	Rotary Kiln	Q/VS	No	41,153	25,619	133	0.22	0.13	7852	NATURAL GAS				58.6	78.6	11.71
810	INC	STACK	Liquid Injection	Q/VS/PBS	No	28,223	15,575	208	0.30	0.11	10515	NATURAL GAS				44.2	96.8	8.84
824	INC	STACK	Liquid Injection	QT/VS/PT/DM	No	1,332	1,068	68	0.02	0.03	798	NATURAL GAS				5.4	8.9	2.00
904	INC	STACK	Two Chamber	WHB	Yes	60,619	4,833	529	0.15	0.04	1802	NATURAL GAS				24.2	24.9	0.30
905	INC	STACK	Liquid Injection	QT/VS/AS/CS	No	2,612	1,467	177	0.30	0.08	1001	NATURAL GAS				5.4	7.4	1.09
906	INC	STACK	Liquid Injection	QT/PT	No	3,193	2,678	77	0.03	0.09	3850	NATURAL GAS				9.3	7.4	1.86
915a	INC	STACK	Rotary Kiln	QC/VS/C	No	103,727	55,033	162	0.14	0.15	35612		FUEL OIL			98.0	132.1	
915b	INC	STACK	Rotary Kiln	QC/VS/C	No	103,727	55,033	162	0.14	0.15	35612		FUEL OIL			98.0	132.1	

TABLE 3-7 SITE-SPECIFIC INPUT CHARACTERISTICS FOR BASELINE COSTS

Site ID	Fuel Oil Heat Input, MMBtu/hr	Coal Heat Input, MMBtu/hr	Total Waste Heat Input, MMBtu/hr	HW Feed, lb/h	Tot-HW Feed, tons/yr	Liquid HW Feed, Fraction	Sludge HW Feed, Fraction	Solid HW Feed, Fraction	Liquid HW Heating Value, Btu/lb	Sludge HW Heating Value, Btu/lb	Solid HW Heating Value, Btu/lb	Fuel Oil Ash, Fraction	Coal Ash, Fraction	Waste Ash, Fraction	HW Feed Penalty, $/ton HWDF	ExistAPCDs Capital cost	ExistAPCDs Annualized capital cost ($/yr)	ExistAPCDs Fixed annual O&M costs ($/yr)
728c			7.35	2,161	8,646	1.00	0.00	0.00	3402	6269	6544			0.01		$ 391,078	$ 48,305	$ 236,612
728d	2.43		7.35	2,161	8,646	1.00	0.00	0.00	3402	6269	6544	0.00		0.01		$ 391,078	$ 48,305	$ 236,612
784			37.67	2,916	8,064	1.00	0.00	0.00	8763	6269	6544			0.00		$ -	$ -	$ -
805			643.81	16,398	65,592	0.99	0.00	0.01	8796	6269	6544			0.04		$ 648,003	$ 83,122	$ 248,875
806	7.33		168.12	50,852	203,409	0.00	0.06	0.94	8763	3295	3307	0.00		0.09		$ 491,560	$ 60,230	$ 160,853
808			96.24	14,443	57,770	0.34	0.00	0.66	6897	6269	6544			0.37		$ 1,911,721	$ 199,838	$ 267,003
809			66.90	7,634	30,538	1.00	0.00	0.00	8763	6269	6544			0.00		$ 542,267	$ 66,832	$ 163,186
810			87.93	10,034	40,135	1.00	0.00	0.00	8763	6269	6544			0.00		$ 688,928	$ 88,687	$ 250,815
824			6.86	782	3,129	1.00	0.00	0.00	8763	6269	6544			0.00		$ 296,460	$ 35,608	$ 232,008
904			24.65	1,802	7,207	1.00	0.00	0.00	13680	6269	6544			0.00		$ -	$ -	$ -
905			6.27	1,000	3,999	0.00	1.00	0.00	8763	6269	6544			0.00		$ 328,141	$ 39,841	$ 233,561
906			5.54	1,043	4,172	1.00	0.00	0.00	5308	6269	6544			0.00		$ 259,634	$ 29,995	$ 121,797
915a	19.60		152.53	21,971	87,884	0.18	0.00	0.82	8763	6269	6544	0.01		0.00		$ 887,797	$ 111,924	$ 179,021
915b	19.60		152.53	21,971	87,884	0.18	0.00	0.82	8763	6269	6544	0.01		0.00		$ 887,797	$ 111,924	$ 179,021

TABLE 3-8. EMPLOYMENT REQUIREMENT SUMMARY AT HAZARDOUS WASTE COMBUSTORS

Position	CINC				GOV/OINC						CK			LWAK
	RK	RK	LI	LI	RK	RK	RK	LI	LI	LI				
	S	L	S	L	S	M	L	S	M	L	S	M	L	
Per System*														
Waste Feeding (c)	6	6									6	9	12	9
Incinerator and CEM Operations	6	6	6	6	3	6	6	1	1.5	2				
Maintenance (a)	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%				
Per Facility														
Supervisor (b)	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%	1	1	1	1
Waste Handling and Storage	6	9	3	6										
Manager and Technical/Regulatory Support	1	1	1	1	0.5	1	1.5	0.5	1	1.5	1	1	1	1
Administrative	1	1	1	1							0.5	0.5	0.5	0.5
Clerical	1	2	1	2							0.5	0.5	0.5	0.5
Safety Coordinator	1	1	1	1							0.5	0.5	0.5	0.5
TOTALS	28	32	16	21	5	9	10	2	3	4	10	13	16	13

*3 shifts per day (around the clock operation)

(a) Maintenance labor costs for all incinerators is 35% of the sum of all other per system labor costs.

(b) Supervisor labor costs for all incinerators is 15% of the sum of all other per facility labor costs.

(c) For cement and lightweight aggregate kilns, also includes waste handling and storage.

CINC = commercial incinerator

GOC = government incinerator

OINC = on-site incinerator

CK = cement kiln

LWAK = lightweight aggregate kiln

RK = rotary kiln

LI = liquid injection

TABLE 3-7. SITE-SPECIFIC INPUT CHARACTERISTICS FOR BASELINE COSTS

Site ID	ExisAPCDs Variable annual O&M costs ($/ton/yr)	#Comb Sys per EPA ID	(Waste Heat Input)/ (Total Heat Input), CIKs Only	#Tested Units per EPA ID
728c	$ 77	4		1
728d	$ 77	4		1
784	$ -	1		1
805	$ 12	3		1
806	$ 1	1		1
808	$ 62	1		1
809	$ 30	2		2
810	$ 67	2		2
824	$ 26	1		1
904	$ -	1		1
905	$ 323	1		1
906	$ 369	1		1
915a	$ 9	2		1
915b	$ 9	2		1

TABLE 3-9. COMBUSTION FACILITY SIZE CATEGORY BREAKDWON

Facility Categories	Size Category	Stack Gas Flow Rate, acfm
Cement Kiln (CK)	Small Medium Large	< 150,000 150,000 - 300,000 > 300,000
Commercial Incinerator (CINC)	Small Large	< 50,000 > 50,000
Government Incinerator (GOV)	Small Medium Large	< 20,000 20,000 - 45,000 > 45,000
On-Site Incinerator (OINC)	Small Medium Large	< 20,000 20,000-45,000 > 45,000
Lightweight Aggregate Kiln (LWAK)	None	

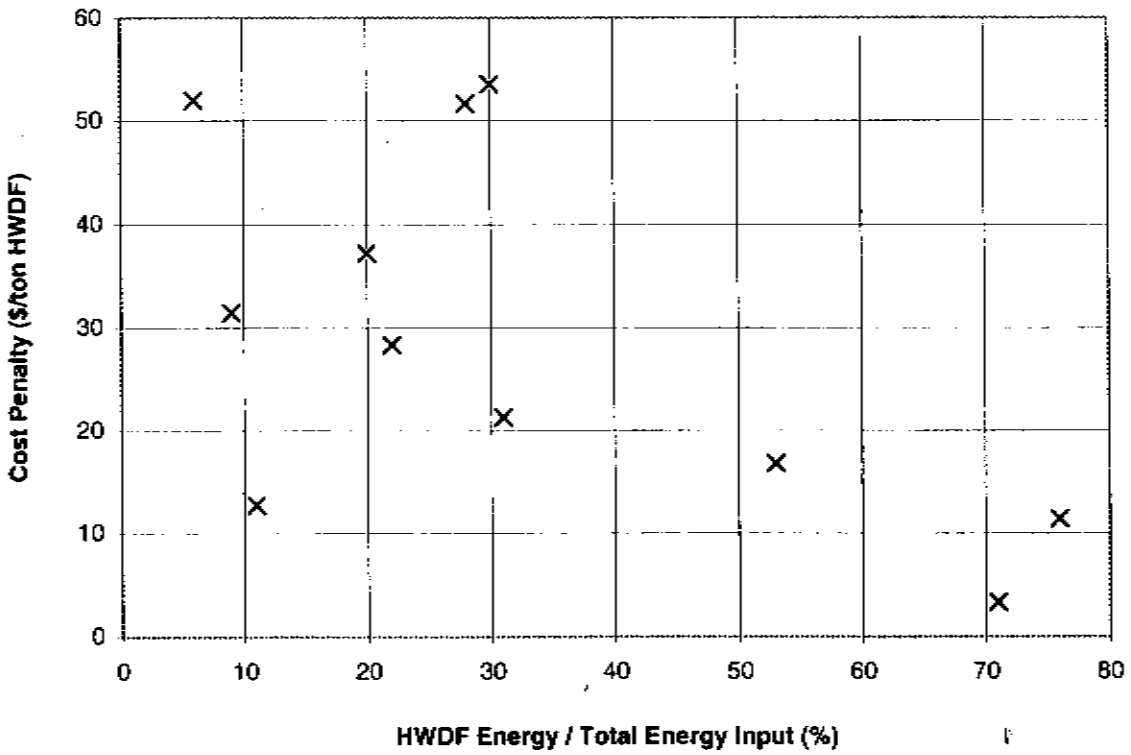

Figure 3-1. Cement kiln cost penalties for burning hazardous waste as reported by CKRC.

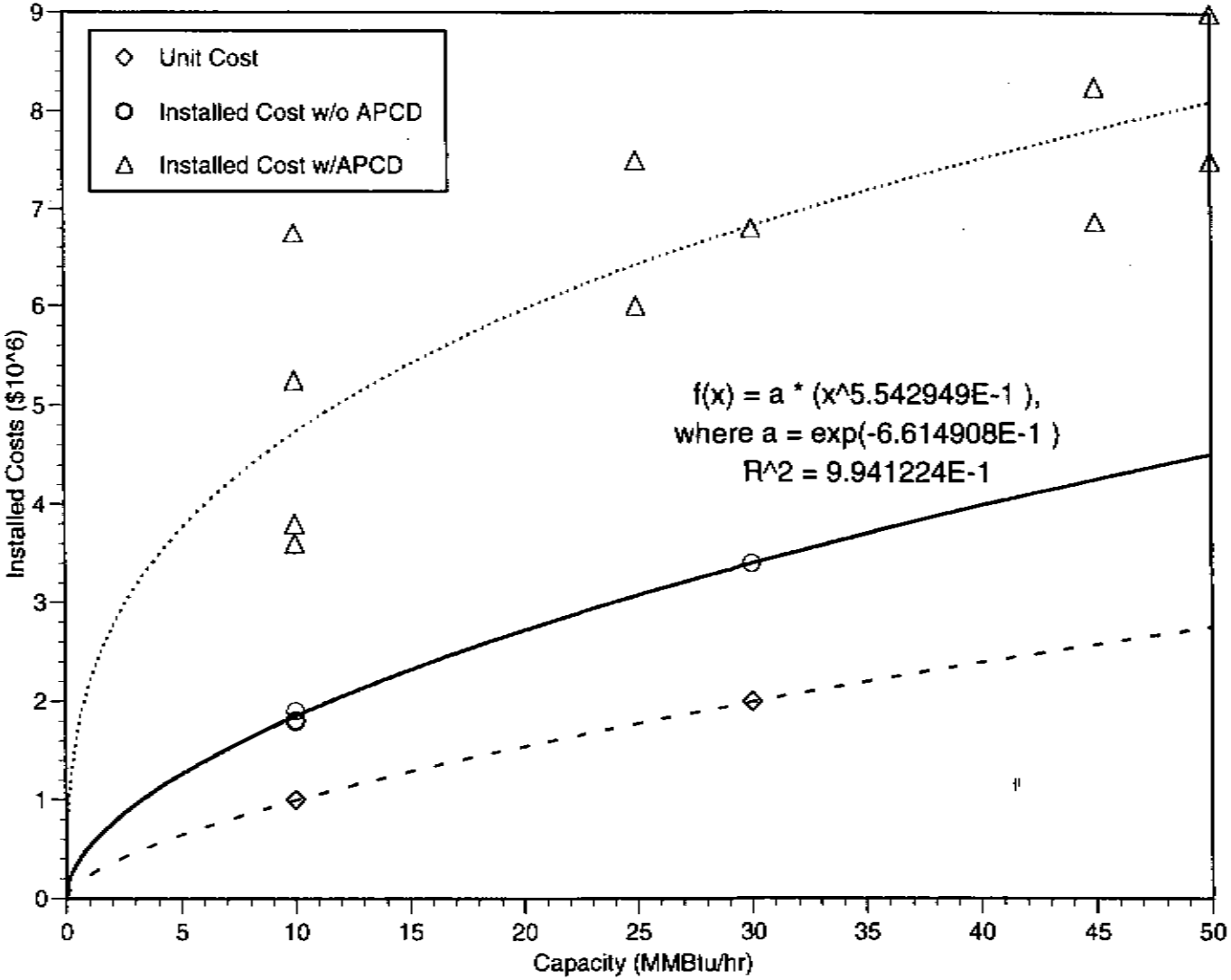

Figure 3-2. Rotary kiln incinerator costs.

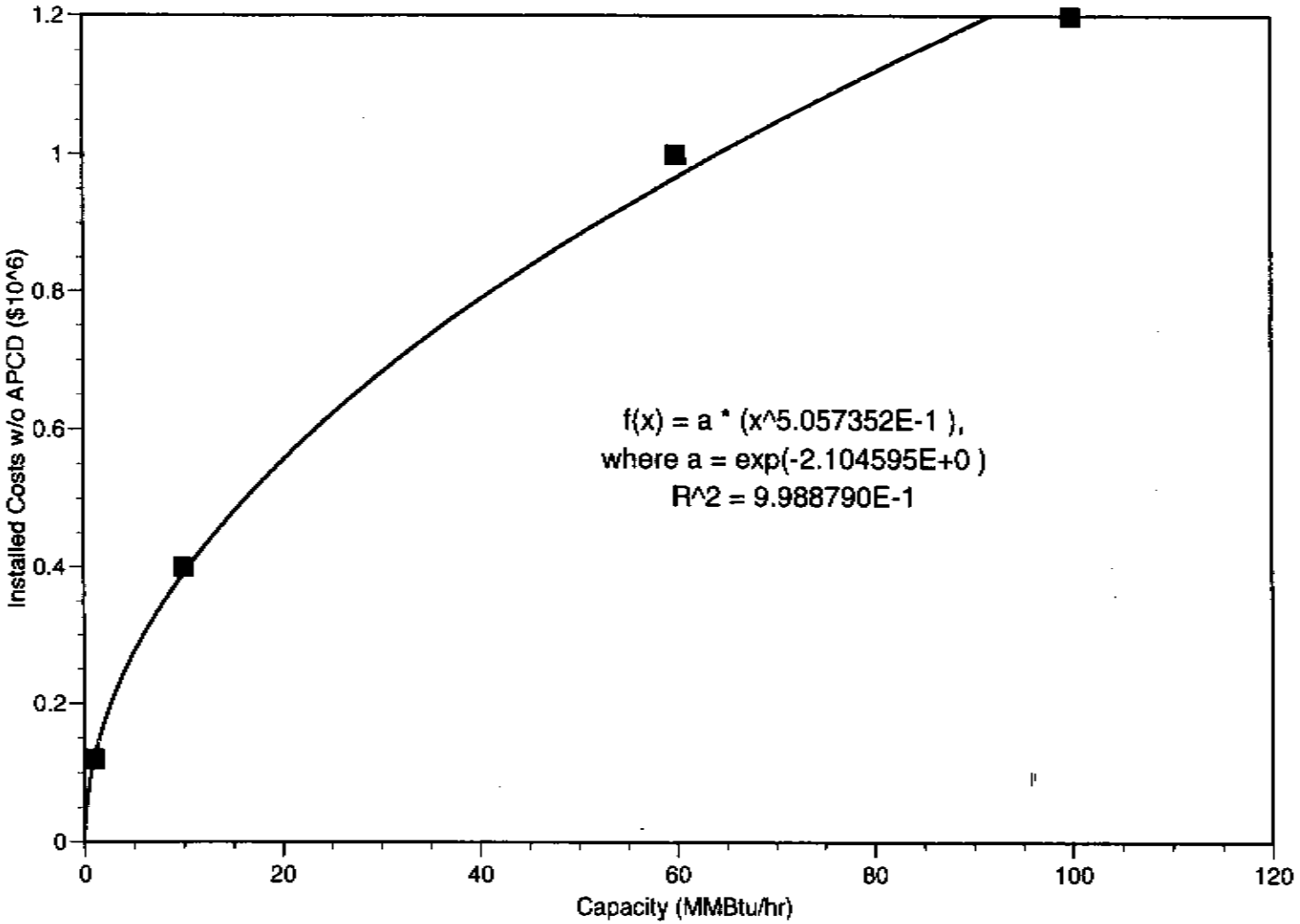

Figure 3-3. Liquid injection incinerator costs.